

We have much pleasure in welcoming Mr. T. Bainbrigge Fletcher, R.N., F.L.S. F.Z.S., F.E.S., who has consented to join the panel of editors of the magazine. His varied experience of practical entomology especially in the study of microlepidoptera in many parts of the world, and his long tenure of duty in India as Imperial Entomologist is a guarantee of his ability to assist in carrying on the study of Variation initiated by our revered founder, the late J. W. Tutt, more than forty years ago. We shall also have in Mr. Fletcher a man of wide experience in the economic field of Entomology, whilst as a field naturalist among the macrolepidoptera his co-operation will be of great value.

In the Special Index an attempt has been made to correct the errors in spelling of specific names and to indicate the correct up-to-date genera with the alternatives or those in general use up to the present. It was the late J. W. Tutt's view that with all names below the species name, a special (i.e. a species) index should include the species and genus to which such names belong. The labour of this is considerable, and errors are almost bound to slip in unless several collaborators take part. In all our current text books and lists numerous names are incorrect, modern innovations and spellings instead of the real original name.

We hope to get more notes of captures during the coming year. Those readers who want information as to captures should also send notes of their own captures. There are many parts of the country still unrecorded as to their insect life; even the commoner species are still unnoted for them.

Good wishes to all.



ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION

DITED

th the

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CONTENTS

Stray Visits to Kerry in Search of Moths, Canon G. Foster, B.D	1
The Coleopterous Fauna of a Willow Swamp in Windsor Forest, H.	
Donisthorpe, F.Z.S., F.E.S., etc	4
Notes on Algerian Butterflies with Special Reference to some Localities in	
Kabylia, Miss L. M. Fison	7
Lithosia pallifrons [vitellina] ab. pygmaeola, H. B. D. Kettlewell	8
Dates of Hübner's Plates (Noctuae), Hy. J. Turner, F.E.S., F.R.H.S	. 9
On the "Illustrations of Varieties of British Lepidoptera," S. S. Mosley,	
S. G. Castle-Russell	10
Notes on Collecting.—C. prombana and its Parasites, C. Nicholson,	
F.E.S.; Late Larvae of D. truncata, Id.; Larvae of P. brassicae, P.	
rapae and P. napi on the same Plant, Id.; A Nature Story, Id.; E.	
polychloros in Essex, E. E. Bentall, F.E.S.; Butterflies in Kabylia,	
Algeria in December, Miss L. M. Fison	10
CURRENT NOTES	13
Societies.—Lancashire and Cheshire Entomological Society	15
OBITUARY.—Edward Step, F.L.S., Hy.J.T	. 16
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JOURNAL OF VARIATION.

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January 15th, 1932.

Stray Visits to Kerry in Search of Moths.

By CANON G. FOSTER, B.D.

It was with great interest that I read Major Graves' article "Collecting in Kerry" in the July-August, 1930 number, since I myself. have casually collected for many years in this county. It was especially so since he has, to some extent, covered the same ground as I have done, only at a different season of the year. I did not, however, touch upon either the Killarney or Kenmare districts proper, which seem to have the highest reputation and where the vegetation is more or less virgin. For much of Kerry strikes one as being but cut out bog, while the more fertile districts have been completely cleared and the old wood absolutely exterminated. The localities I have worked in recent visits are the Inch peninsula on the North side of Dingle Bay; the South side of Caragh and Glenbeigh, Kells, and Valentia Island; then further South of Dingle Bay, Darrynane, West Cove, Sneem and Blackwater. Inch is most promising, though I had only about 10 days there, there are 5 miles of sandhill backed by marsh, with cliff and mountain on the mainland. Caragh is a miniature Killarney with plenty of wild native scrub. These are the 2 best localities as worked. Entomologists in Ireland labour under difficulties principally from lack of fellowship. They may average one in a county. They cannot compare notes and so learn what to look for, or where to look for it. Under such circumstances, through ignorance. no doubt numerous insects though perhaps locally abundant escape detection. Again we have no one with whom we can compare our specimens. Accordingly this record will be found, I am painfully aware, much poorer than it ought to be, or would be, if made by a trained English collector. It might be mentioned that some of the commoner species are omitted as I did not preserve specimens.

RHOPALOCERA.

Pieris brassicae, L.—Summer brood abundant at Valentia; autumn ditto Ballymac Elligott. As Major Graves remarks they are very similar to the English specimens.

P. napi, L.—Both broods are very abundant; Valentia supplied a small specimen, of which the upperside of the wings are both very dark and also strongly tinged with yellow.

Colias croceus (edusa).—Single specimens at Caragh, July; Kells,

August; Valentia, August.

Euchloë cardamines, L.—As a schoolboy at Ballymac Elligott this was my earliest capture,—the males. I took 2 females, June, 1928, at Valentia, typically Irish, the lower wings upperside strongly tinged with yellow.

Melitaea aurinia, Rott.—In the beginning of June, 1928, M. aurinia was most abundant at Darrynane, both in the sandhills near the Abbey and also higher up the valley among the woods. Later on in the month a single specimen appeared on Valentia; where it came from I do not know, but I am inclined to think the headquarters must have been on the islands in the harbour. The Kerry aurinia, as far as my experience went, is not nearly so strongly marked as Mr. T. Greer's Tyrone broods, which are far more highly coloured.

Dryas paphia, L.—Ballycarthy near Tralee used to be my hunting ground in the early eighties for D. paphia. Some of the specimens

which I still possess are verging towards ab. valesina.

Aglais urticae, L.—Everywhere abundant, August, on the flowers of

the creeping thistle.

Pyrameis atalanta, L.—Abundant on every nettle patch at Ballymac Elligott in August-September. Here (Co. Down) I do not see it frequenting the nettles, but instead it attends to the garden flowers. Can it be that here in the north the specimens are but migrant, while in the south they are native born and therefore continue attached to the food-plant on which they were reared?

Pyrameis cardui, L.—Abundant at Valentia, June, 1928, also on the mountains above Aunascaul, July, 1905. I always, strange to say, find P. cardui abundant on Irish mountain tops (as also P. atalanta in the North) the earlier part of the season. So at Valentia it was on the higher ground it occurred profusely, while in the lower parts of the

island I do not remember noticing it.

Vanessa io, L.—Abundant, August and September, at Ballymac Elligott. In July, 1905, there were some huge colonies of larvae on nettles at Inch. I have not noticed anything abnormal in the markings. V. io constantly attempts to colonise the North of Ireland, but it never seems to succeed.

Pararye asgeria, L.—Very generally distributed and is to be seen on the wing here (Co. Down) from the end of April till late September. Plentiful at Valentia in June and at Ballymac Elligott in August and September. The Kerry specimens appear darker than those of the Co. Down.

Pararye meyera, L.—Very general, abundant at Ballymac Elligott in August and September.

Epinephele jurtina, L.—Abundant; Valentia, June, 1928.

E. tithonus, L.—The only place I have met it was on an island in Lough Curran at Waterville in August.

Coenonympha pamphilus, L.—Abundant at Inch, June and July.
Ruralis betulae, L.—Was recorded in "the Field" some years ago
from Milltown in September, but I have not met it.

Strymon quercus, L.—The locality for S. quercus is the Glencar end

of Lough Caragh, but again I have not tried for it.

Callophrys rubi, L.—Abundant and widely distributed in south Kerry. My localities are Caragh, Lough Acoose, Kells, and Darrynane at the end of May and throughout June.

Rumicia phlaeas, L.—Valentia, June, including an abnormally small

specimen, otherwise they did not show much variation.

Polyommatus icarus, Rott.—Valentia, June, 1928.

Lycaenopsis argiolus, L.—Very abundant at Caragh, May-June, 1912, but they were so worn as not to be worth taking. One specimen was beaten out of a holly tree at Glanleaw, Valentia, June, 1928. I have seen no signs of a second brood in Kerry.

SPHINGIDAE.

Mimas tiliae, L.—Miss O'Connell has taken the larva and reared the perfect insect at Darrynane.

Amorpha populi, L.—Abundant, e.g., the perfect insect was taken

by me on wing in Valentia, June, 1928.

Smerinthus ocellata, L.—Taken by the Miss Delaps at Valentia.

Theretra porcellus, L.—Inch, July, 1905.

Eumorpha elpenor, L.—Caterpillar abundant in Valentia, August.

Hemaris tityus, L.—Frequented rhododendron flower at Caragh in extraordinary abundance, June, 1912; Valentia, June, 1928.

NOTODONTIDAE.

Cerura vinula, L.—Caragh, Valentia, abundant.

Stauropus fagi, L.—The caterpillar has been taken and reared by the Misses O'Connell at Darrynane.

Leucodonta bicolor, Hb.-I have obtained two specimens in S.

Kerry.

After sheltering under a hazel tree from a heavy thunder shower, I proceeded to beat my host with the result that L. bicolor tumbled out. I showed it to my friends with whom I was staying and the next evening on returning they informed me they had found a second specimen resting on the window ledge. Both were in perfect condition. This was the beginning of June.

Lophopteryx camelina, L.—No doubt abundant if searched for in the larval stage. One specimen came to the light of my lamp while I was

reading, the beginning of July.

Phalera bucephala, L.—Abundant, e.g., at Valentia, June, 1928.

THYATIRIDAE.

Thyatira batis, L.—Abundant, Glanleam Valentia, June, 1928. Palimpsestis duplaris, L.—Abundant in the Caragh woods, June, 1912.

 $P.\ fluctuosa,$ Hb.—I beat out a single specimen in the Glencar woods, June, 1928.

LYMANTRIIDAE.

Orgyia antiqua, L.—Larva at Ballymac Elligott.
Dasychira pudibunda, L.—Larva at Blackwater, October, 1908.

Lasiocampidae.

Macrothylacia rubi, L.—Most seasons the caterpillar is in profuse abundance on blackberry leaves through the autumn, and the moth itself flies wildly the end of May over the heather, e.g., at Caragh, May-June, 1912.

DREPANIDAE.

Drepana lacertinaria, L.—Abundant around Caragh, June, 1912.

Spilosoma lubricipeda (menthastri), Esp.—Abundant, West Cove, June, 1928.

Diaphora lutea (lubricipeda), Esp.—Abundant, Valentia, June, 1928. Both of the above I have found so abundant in both larval and perfect stages that I have few records. But I have not met with any of the remarkable varieties such as one finds in Scotland.

Parasemia plantaginis, L.—On the mountains around Aunascaul,

July, 1905.

Arctia caia, L.—Abundant everywhere, e.g., Valentia, 1928.

Hipocrita jacobaeae, L .-- Apt to snow you out if you work with light in July, e.g., at Inch, July, 1905. At times the ragweeds in August are curtained with the larvae. The perfect insect has a habit of falling into the dust of the road, and it used to be a duty of us children to rescue them and restore them to the grass.

Nudaria mundana, L.—Locally abundant; Inch, July, 1905.

(To be concluded.)

The Coleopterous Fauna of a Willow Swamp in Windsor Forest.

By HORACE DONISTHORPE, F.Z.S., F.E.S., etc.

One of the many productive spots for insects in Windsor Forest is a willow swamp where we have worked on and off for the last five years—chiefly for Coleoptera, though a certain number of Hymenoptera (Sawflies, etc.) and Diptera have been taken. Some of the willows are cut down for faggots every year in different parts of the swamp and these make very good traps for insects. A few of these faggots are generally left from year to year; and these and the moss, which grows around the roots and stumps of the willows, are very productive. The undergrowth consists of Flags (Iris pseudacorus), which grow to a great height; Comfrey (Symphytum officinale); Convolvulus (Calystegia sepium); Meadow-sweet (Spiraea ulmaria); Meadow Crane's-bill (Geranium pratense); Marsh Yellow Cress (Nasturtium palustre); Purple Loosestrife (Lythrum salicaria); Woody Nightshade (Solanum dulcamara); coarse grasses, etc., etc. Some of these, of course, grow on the margins and more open spaces of the swamp, as do also a few Blackthorns (Prunus spinosa) and Hawthorns (Crataegus oxyacantha). couple of small pools of water are present, and sometimes after very wet weather the bottom of the swamp is entirely under water in the winter. A certain number of species I have only taken in this spot in Windsor Forest, and others I have only taken here at all.

The total number of species taken in this swamp to date is 162; a full list of which is given at the end of this paper. All the rare and more interesting species are marked with an asterisk; but it may be as well to say a few words about some of them.

Helophorus laticollis, Th.—As far as I know this species has only

been taken at Woking and the New Forest heretofore.

Oxypoda salictaria, Donis.—I have recently described this species which is new to science, from a specimen taken in moss in this swamp.

Oxypoda nigrocincta, Muls.—This species has only been taken at Yarnton near Oxford, before, where I first discovered it, new to Britain, in a marshy place. In both localities it was found in damp moss in

company with Calodera riparia, Er., and C. aethiops, Gr.

Proteinus macropterus, Gyll.—I have taken this species on several occasions in this spot, by sifting moss. Fowler gives fungi as well as flood refuse, etc. In the experience of others who have taken it since Fowler's work and in that of my own, this insect is not found in fungus.

Meligethes morosus, Er.—Fowler treats this insect as being a somewhat doubtful species. I swept a specimen in this swamp with dark legs which Colonel J. Sainte Claire Deville identified as M. morosus,

Er.

Micrambe villosa, Heer.—Abundant by beating faggots (I have taken it in plenty by beating faggots in a wood in Windsor Forest, very far removed from this locality) and by sweeping. Neither broom nor gorse occurs near this swamp.

Dasytes plumbeus, Muls. (oculatus, Fowler).—Plentiful by sweeping and beating; this very distinct species may be easily known by the very large eyes in the 3, but especially by the partly yellow anterior

femora in both sexes.

Longitarsus pellucidus, Foudr.—Locally plentiful on Convolvulus. Fowler gives Trifolium and Mentha, but Reitter gives Convolvulus arvense as the foodplant.

Ceuthorhynchidius palustre, Edmonds.—By sweeping Nasturtium palustre. This distinct little species has only been taken at Bovey

Tracey, Devon, the type locality before.

Centhorhynchidius rufulus, Dufonr.—This species is chiefly found at the seaside and almost confined to the South Coast. I was rather astonished at sweeping a specimen in this swamp.

I am indebted to Mr. Keys for the names of the Athetae, and Mr.

Britten for the name of the Trichopteryx species.

CARABIDAE.—Dyschirius globosus, Hbst., Acupalpus meridianus, L., Anchomenus albipes, F., A. oblongus, F., A. micans, Nic., *A. scitulus, Dj., Bembidium rufescens, Guér., B. biguttatum, F., B. riparium, Ol., *B. clarki, Daws., Dromius linearis, Ol., D. melanocephalus, Dj.

Hydrophilidae.—Helophorus aensipennis, Th., *H. laticollis, Th.,

H. brevipalpis, Bed.

STAPHYLINIDAE.—Aleochara lanuginosa, Gr., *Oxypoda salictaria, Donis., O. longiuscula, Gr., *O. nigrocincta, Muls., Ocyusa maura, Er., *Calodera riparia, Er., *C. aethiops, Gr., *Atheta cambrica, Woll., A. tomlini, Joy., A. graminicola, Gr., A. nigella, Er., A. aequata, Er., A. circellaris, Gr., A. analis, Gr., *A. major, Sharp., *A. decipiens, Sharp., A. ravilla, Er., *A. canescens, Sharp., A. sordida, Marsh., A. laticollis, Steph., A. fungi, Gr., A. clientula, Er., *Gyrophaena lucidula, Er.,

*Placusa infima, Er., Hygronoma dimidiata, Gr., Oligota inflata, Man., *O. parva, Hr., *Conosoma pedicularium, Gr., Tachyporus obtusus, L., T. solutus, Er., T. pallidus, Shp., T. chrysomelinus, L., T. humerosus, Er., T. hypnorum, F., Quedius filiginosus, Gr., Q. cinctus, Pk., Q. rufipes, Gr., Q. schatzmayri, Grid., Gabrius nigritulus, Gr., G. pennatus, Shp., Lathrobium brunnipes, F., *L. filiforme, Gr., Stenus bimaculatus, Gyll., S. juno, F., S. rogeri, Kr., S. pusillus, Er., *S. exiguus, Er., S. fuscipes, Gr., S. nanus, Fauv., *S. carbonarius, Gyll., *S. argus, Gr., S. brunnipes, Steph., S. pallipes, Gr., S. bifoveolatus, Gyll., S. latifrons, Er., Oxytelus rugosus, F., Haploderus caelatus, Gr., Trogophloeus elongatulus, Er., T. corticinus, Gr., Lesteva longelytrata, Goez., L. heeri, Fauv., Homalium rivulare, Pk., H. caesum, Gr., Proteinus ovalis, Steph., *P. macropterus, Gyll.

SILPHIDAE.—Choleva nigricans, Spence.

Scydmaenidae.—*Euconnus hirticollis, Ill.

Pselaphidae.—Tychus niger, Pk., Rybaxis sanguinea, L., *R. sanguinea ab. nigripennis, F. and D.

TRICHOPTERYGIDAE.—Trichopteryx fratercula, Mat.

Phalacridae.—Olibrus aeneus, F.

Coccinellaidae.—Coccinella 10-punctata, L., C. 11-punctata, L., Halyzia 22-punctata, L., Chilocorus similis, Ross., Coccidula rufa, Hbst.

NITIDULIDAE.—Brachypterus urticae, F., Cercus bipustulatus, Pk. Pria dulcamarae, Scop., Meliyethes difficilis, Heer., *M. morosus, Er. (black legs), Epuraea aestiva, L., E. florea, Er.

Lathrididae.—Enicmus transversus, Ol., Melanophthalma fuscula,

Hum.

Cryptophagus dentatus, Hbst., *Micrambe villosa, Heer., Atomaria umbrina, Gyll., A. fuscata, Sch., A. atra, Hbst., A. pusilla, Pk., A. analis, Er., A. ruficornis, Marsh.

Scarabaeidae.—Aphodius sticticus, Pz.

Telephoridae.— Telephorus haemorrhoidalis, F., T. bicolor, Hbst. (thoracicus, Ol.), T. bicolor, Hbst., ab. suturalis, Schil., *T. bicolor, Hbst.,

ab. theresae, Pic., *Dasytes plumbens, Muls. (oculatus, Fow.).

Chrysomelidae.—Melasoma populi, L., *Plagiodera versicolora, Laich., Phaedon tumidulus, Germ., Phyllodecta vitellinae, L., *Galerucella pusilla, Dufts., *Longitarsus castaneus, Dufts., L. luridus, Scop., *L. flavicornis, Steph., L. pusillus, Gyll., *L. pellucidus, Foud., Phyllotreta nodicornis, Marsh., P. atra, Pk., *Crepidodera chloris, Foud., C. aurata, Marsh., Chaetocnema hortensis, Fourc., Psylliodes affinis, Pk.

Pythidae.—Rhinosimus planirostris, F.

Mordellidae.—*Anaspis florenceae, Donis., A. subtestacea, Steph., A. maculata, Fourc., A. maculata ab. pallida, Marsh.

Anthicidae.—Anthicus antherinus, L.

Curculionidae.—Rhynchites uncinatus, Th., Apion dissimile, Germ., A. nigritarse, Kirb., A. apricans, Hbst., A. onopordi, Kirb., A. virens, Hbst., A. dichroum, Bed., A. loti, Kirb., *A. simile, Kirb., *A. pubescens, Kirb., A. humile, Germ., A. aethiops, Hbst., Exomias araneiformis, Schr., Phyllobius pomonae, Ol., P. viridiaeris, Laich., Sitones sulcifrons, Thunb., Hypera variabilis, Hbst., H. nigrirostris, F., Anthonomus rubi, Hbst., Nanophyes lythri, F., Miccotrogus picirostris, F., Ceuthorhynchus contractus, Marsh., C. erysimi, F., *C. hirtulus, Germ., Ceuthorhynchidius floralis, Pk., *C. palustre, Edmonds, C. troglodytes, F., *C. rufulus, Duf.!, Phytobius comari, Hbst.

Notes on Algerian Butterflies with Special Reference to some Localities in Kabylia.

By Miss L. M. FISON.

(Continued from Vol. XLIII., p. 167.)

Leptosia duponcheli.—Spring and summer.

Pontia daplidice.—The plain of the Sebaou near Azazga. (L.M.F.)

v. raphani.—Sebaou, Tlemçen, Lambèse.

v. albidice.—Algiers, Plateaux, Tell, Sahara.

v. flava.—Biskra.

Anthocharis belemia f. glauce.—Biskra, Blida-Lambèse, Guelma, Bougie, Bon-Saada. Very fine in Sebaou Valley. (L.M.F.)

ab. distincta.—Philippeville, Batna.

ab. evanescens.—El Kantara.

ab. desertorum.—Tunis.

ab. falloui.—Biskra, Plateaux, Sahara.

ab. seitzi.—Biskra.

A. belia (crameri) r. ausonia.—Kantara, Blida, Tell, Constantine, Lambèse, Guelma. This butterfly is one of the commonest insects of Kabylia. I have frequently observed it from March until June on the mountains at the back of Djemaa Sapridj—on the mountains above Fréha and on the mountains and in the ravines all around Michelet. It flies often at a considerable height. (L.M.F.)

Euchloë tagis.—Algiers, El Kantara, Plateaux, Lambèse.

E. charlonia.—Biskra, Kantara, Msila, Plateaux.

E. eupheno.—Atlas, Lambèse, Guelma, Blida, Philippeville, Tlemçen, Hammam. This beautiful southern "orange tip" is very common in Kabylia, and is one of the earliest butterflies to appear. Sometimes in February it is already on the wing. Some localities for eupheno are the Valley of the Sebaou near Mékla, and mts. around, all around Azazga, at Port Gueydon, in ravines around Michelet, in the Gorges de la Chiffa near Blida; between Marbot and Teniett-el-Had, on the Bauzarea hills near Algiers, and above the Boulevard Bru. It seems to fly from end of February to May.

I have never seen E. cardamines in N. Africa and should be interested

to know if it exists here. (L.M.F.).

Teracolus evagore r. nouna.—Biskra, Aurès Mts., Oran, Plateaux, Sahara.

Gonepteryx rhamni r. meridionalis.—Algiers, Tell, Plateaux,

Kabylia.

G. cleopatra.—Teniett, Algiers, Plateaux, Tell. It is abundant in Kabylia, and I have seen it at Mékla, Azazga, Fréha, Michelet, and

Port Gueydon. (L.M.F.)

Colias hyale and Colias croceus (edusa).—The "clouded yellows" especially croceus are common in Kabylia, and in places they literally swarm, The fields in the plain of the Sebdou are alive with these insects in March, April, May, and even in June. They appear again in the autumn. Mr. Tutt says of "edusa" that its true home is along the Mediterranean littoral and in the Algerian Valleys." This is certainly true in Kabylia. It would be interesting to know how many broods there are in Algeria. Mr. Tutt suggests there may be four, in February, May, August, and October. I wonder is this so? or if

the clouded yellows are an especially strong race of butterflies and live longer than some. I have seen them flying vigorously although considerably worn and old. (L.M.F.)

Melanargia galathea.—Teniett, Saida.

M. ines.—Teniett, Plateaux, Tell. I shall hope to look more carefully

this year for ines, also for M. syllius. (L.M.F.)

The genus Satyrus.—This genus is well represented in Algeria. The forest region between Azazga Yakouren and Elkseur should prove a fruitful locality for the Satyrids. In this forest, composed for the most part of the chêne-zien and the chêne-liège wild boar are plentiful, also hyaenas, and occasionally panthers are to be found. Flocks of monkeys roam in the secluded parts, and occasionally may be seen sporting in the trees, or in the ravines drinking at the brooks. (L.M.F.)

Satyrus alcyone.—Philippeville, Kabylia.

Satyrus briseis, r. major.—Kabylia, Aurès Mts., Tlemçen, Plateaux.

S. prieuri.—Plateaux, Tell.

S. semele r. algirica.—Algiers, Teniett. S. statilinus r. hansii.—W. Algeria, Sebaou.

S. fatua.—W. Algiers.

S. abdelkadir.—Oran, Plateaux, Tell. v. lambessana.—Aurès Mts.

Pararge aegeria.—Azazga, Michelet, Sebaou, Mékla, all the season. (L.M.F.) Algiers, Guelma, Bougie, Philippeville. r. intermedia.— Blida.

P. megera.—Aumels, Aggribbes, Port Gueydon, Sebaou, Michelet. (L.M.F.)

P. maera r. lyssa.—Guelma.

Epinephele janiroides.—Kabylia, Guelma.

E. pasiphaë.—Teniett. r. philippina, Teniett, Oran, Guelma.

E. ida.—Tlemçen. r. caecilia.—S. Algiers.

E. jurtina r. fortunata.—Teniett, Hamman, Oran. r. mauretanica. -Teniett.

Coenonympha arcanoides.—Atlas, Blida, Plateaux, Tell.

C. fettigii.—Sebaou, Tell.

C. pamphilus.—Hamman, Sebaou (common). Michelet. (L.M.F.) r. lyllus, Sebaou, Tlemcen, Salda Marina, Guelma.

(To be concluded.)

Lithosia pallifrons [vitellina] ab. pygmaeola. (Doubleday.)

By H. B. D. KETTLEWELL.

On the night of August 5th I was collecting near Lydd in Kent. Moths were coming in numbers to the headlights of my car. At 12.15 a.m. there arrived two "footmen" (3s) which I thought must be Lithosia caniola on account of their habit of rolling their wings around their bodies, thus making a narrow and very inconspicuous cylinder of themselves.

Also L. caniola is recorded as having been taken in "Romney Marsh."

On examining them a few days later I found that they were not L. caniola and did not fit in with any British "footman" I knew.

Mr. Tams at the British Museum (Natural History) has been good enough to identify them. He made preparations of the genitalia of:-

i. Our so called L. lutarella ab. nyamaeola from Deal.

ii. Continental L. lutarella.

iii. Continental L. pallifrons.

iv. My two Lithosia.

He has reported that the species which has flourished so long on the Deal Sandhills under the specific name of "lutarella" is not really that species but is in fact a form of L. pallifrons (vitellina), hitherto an exclusively continental species. Furthermore he has identified my two Lithosia as this species also. Whereas the form hitherto taken in England-namely at Deal and, I understand, the Norfolk Sandhills—has been referable to ab. pygmaeola an account of its marked difference from the Continental form, my two from near Lydd are identical with the true Continental pallifrons and they differ from pygmaeola in the following points:

i. Their much larger size—being nearly a quarter as large again

as my largest pygmaeola male from Deal.

ii. The well-marked yellow colour of the wings.

iii. The bright yellow thoracic tufts.

iv. The distinct black shading at the base of the hindwings.

It will be noted that this locality is nearly forty miles distant from the original locality at Deal and that this new ground has no sandhills anywhere near it. I think that this little colony (as I hope it is) provides a link between our local pygmaeola form on the one hand and the true Continental pallifrons on the other.

I wish to thank Mr. Tams for his work in identifying these species.

Dates of Hübner's Plates (Noctuae).

The date usually quoted for Hübner's Text Noctuae is 1805. This seems to be an impossible date, since there are descriptions of many species which were not figured until much later; for instance fig. 653 (Text p. 185) was issued between 1818 and 1822, and nearly 60 of the figures mentioned in the text were issued between 1808 and 1818. On the other hand fig. 613 was mentioned on the third page of the text, p. 158.

The dates of Hübner's Noctuae Plates as given me by my late colleague Mr. J. Durrant of the S. Kensington Museum are as

follows :-

Plates 1-74 (figs. 1-345) 1802.

75-86 (346-405) 1802-1808.

87-94 (406-445) 1808.

95-139 (446-638) 1808-1818. 29

140-150 (639-697) 1818-1822. 99

151 (698-703) 1823. ,,

152-160 (704-752) 1826-1828. ,,

161-169 (753-802) 1828-1833. ,,

170-176 (803-839) 1834. 22 ,,

Hy.J.T. 177-185 (840.882) 1834-1841.

On the "Illustrations of Varieties of British Lepidoptera" S. L. Mosley.

By S. G. CASTLE-RUSSELL.

With reference to Mr. Griffin's interesting article on the above work, I possess a copy which is identical with the one he describes. My copy was obtained for me by Mr. Mosley himself in 1912 and compared by him with an original subscriber's copy to which he had access. I think it can therefore be taken for granted that the work as described and collated by Mr. Griffin is complete, and as issued to subscribers. Mr. Mosley told me that the parts were entirely his own handiwork, including the printing. A cheaper edition appears to have been issued consisting of 6 parts with 30 coloured plates, for in a "Quaritch" list of 1922 an extract from a letter from Mr. Mosley to Van Voorst is given as follows:—"If your subscriber desires he can be supplied with hand painted copies of varieties at the usual price of 8s. per part but they take so much labour that I sent out the 5s. parts to all who would be satisfied with them."

Information on these old books is very useful. Mr. Turner I believe possesses a copy of the very rare work by Petiver and it would be of

great interest if he would describe it.

OTES ON COLLECTING, etc.

Cacoecia pronubana and its Parasites.—On September 9th last I received a consignment of some two dozen larvae and pupae of this species very kindly sent by Mr. Robert Adkin from Eastbourne, with some foliage of Euonymus japonica and Coronilla glauca. none of the former I substituted the wild E. europaeus, which is abundant about here and in the garden, and I also have a good sized plant of the Coronilla. I subsequently found that the larvae did not appreciate the wild spindle but fed up on the Coronilla entirely. The first moth, a female, came out on the 5th, and the next was a male on the 13th, after which one or two appeared about every other day until the end of the month, most of them being males. I let 2 go, kept several for eggs and set the rest. Several batches of eggs were laid in a pillbox, some being yellow and others green; no change has taken place in their coloration, but all of them seem to have flattened and I fear all are infertile, though I shall keep them until the spring to see whether they will hatch.

Two Braconids, probably Meteorus sp., appeared in September but unfortunately I lost them both. In October a couple of Tachinids emerged which Miss Aubertin has kindly determined as Nemorilla floralis and says that although they have been reared from several lepidopterous hosts, including Cacoecia murinana—which, by the way, I cannot find in Meyrick and suppose it is a continental species [yes]—she has seen no record from C. pronubana.—C. Nicholson, (F.E.S.)

Tresillian, Cornwall, November 23rd.

Late Larvae of Dysstroma truncata.—On October 13th I boxed a somewhat worn female of the centum-notata form of this species, the dark forms of which are commonest about here, with an occasional comma-notata and are usually seen in and about the house in late

autumn. I kept her for eggs and was rewarded with about 50, laid on the glass and paper of the receptable in which I kept her and also on the potted sallow plant provided for her. I kept these eggs for three weeks not expecting them to hatch, as several had caved in badly, suggesting infertility, and wanting the glass I rubbed off those on it (about a dozen) as most of them had collapsed. The rest were put into a glass bottomed pillbox and I was surprised to see that in a few days they began to darken slightly and a larva hatched on November 10th. The sallows being all but leafless I potted up a small plant of wild strawberry which abounds in the garden and as the larvae hatched at the rate of one or two daily they were placed on the plant and at once made themselves at home and began to feed. At present there are about 20 feeding comfortably and the 5 remaining eggs will probably not hatch. I send this note because it seemed very late for larvae to hatch, but as they hibernate and strawberry is evergreen I suppose it doesn't matter! I have little doubt that strawberry is their normal food here—in the winter at any rate—and a search of the wild plants might result in a good haul of larvae, but they would be extremely difficult to see, being at present only a fifth of an inch in length and just the colour of the ribs on the underside of the strawberry leaves, on which they extend themselves at rest. I was struck by their almost perfect invisibility when extended upwards from the lid of the pillbox, owing to their being nearly white, and even when I used a reading glass to make sure that I did not miss one I often spotted them only because of their brown heads.—C. Nicholson, Tresillian, Cornwall. November 23rd.

LARVAE OF PIERIS BRASSICAE, P. RAPAE AND P. NAPI ON SAME PLANT.— I noticed some larvae of P. rapae on a plant of sea kale in the garden grown for its wonderful autumn colouring and not for culinary purposes—and on examining the plant carefully I found those of P. brassicae and P. napi also. I wonder if this is a record, as P. napi does not usually descend to cabbage! One pupa of P. napi was found under a window sill in the verandah; this was bright green with a few brownish marks and was evidently discovered by a wren, which takes the place of the bat in winter and picks up spiders, flies and other unconsidered trifles there. High up on the brown hall-window frame is another of a pale buff-grey. Under another window-sill outside the verandah is another pale grey pupa and high on the open wall near is a dark grey one. These two should have been reversed in site to suggest the protective coloration theory! We always find a few P. rapae pupae in and about the verandah, but they always disappear when the weather becomes generally colder, except in two cases when the larvae (one P. rapae in the sitting-room and one P. brassicae in the bedroom!) entered through the windows and pupated It is remarkable that the larvae escape destruction whilst crawling up the wall and awaiting pupation, but are picked off as pupae which are on the whole less conspicuous, and it can only be explained, I think, by the keener searching by the birds in colder weather.—C. Nicholson, Tresillian. November 23rd.

A NATURE STORY.—The following anecdote appeared in the "Western Morning News" of November 7th under the above heading and I am

sending it out of curiosity to see whether any reader can identify the "beetle" and its "parasite." I do not know who J.B. is and I haven't attempted to communicate with him through the editor as I find that

such attempts are almost invariably futile.

"The streaked-winged lightning beetle crawls slowly up the rough surface of the granite wall, its wing-cases of metallic blue glinting as it turns in and out of the crevices. The beetle is in pain, for now and then it pauses, to repeatedly strike with one hooked leg the roughened surface, dislodging the weathered grains of stone with its wasted efforts.

"Faster it seems to writhe, almost losing its grip on the stone, then suddenly a little insect appears on its head, running swiftly over the polished, horny skin. Scarce as big as a pin's head, it seems but a yellow spot as it checks and turns, to creep round over the beetle's back and push itself into the crevice between head and neck. Sharply the beetle rears, and once more the parasite is dislodged, taking almost the same path as before.

"While it creeps slowly back the beetle stumbles onwards, half-falling as the carelessly clutched granules give way. The insect attacks again. The antennae tremble, and the wing-cases are half lifted as if for flight. Wearily the beetle raises itself, shifting its weight from leg to leg. It is weaker now, and only for a brief space does the insect withdraw from the neck. One more struggle, and then the beetle falls, to lie helpless on the ground with legs waving feebly in the air.—J.B."

The description of the beetle suggests a Geotrupes, and of the parasite, one of the usual mites, but how can the name be accounted for? No doubt it is "something" striatus and there is a good deal of fancy in the interpretation of the phenomena observed !—C. Nicholson.

Eugonia polychloros in Essex.—The large tortoiseshell had been fairly common in this neighbourhood up to the year 1910. In 1911 it was fairly plentiful and nests of caterpillars could be seen on many trees. I collected a number of the larvae, which were fullfed: they proved to be all stung. Since that year I have not noted one butterfly, although continuously on the look out. I wonder whether any of your readers have noticed the absence of this species elsewhere. I expected this area would have been peopled again by immigration, but it is not so.—E. E. Bentall, (F.E.S.) Wickham Bishops, Essex.

Butterflies in Kabylia in December.—The following butterflies were flying here at Michelet, Kabylia, Algeria up to December 18th last, when we had our first fall of snow. Colias croceus (edusa), Pyrameis cardui excessively common, Pararge aegeria, P. megera, Aricia medon 1, Rumicia phlaeas common, Pieris rapae and P. brassicae occasionally. Anthocharis belia (crameri) r. ausonia, Gonepteryx rhamni and Eugonia polychloros both of which last hibernate here.—(Miss) L. M. Fison, Michelet, Algeria. January, 1932.

CURRENT NOTES AND SHORT NOTICES.

In the Ent. Zeit. for August, H. Auel reports finding a chrysalis of Aglais urticae on October 26th, 1930, at Sansouci from which, in a warm and moist atmosphere, the image emerged on November 9th, and contends that this represents a third generation.

The Int. Ent. Zeit. for Sept. contains a well illustrated account of the breeding, biology and structure of Ruralis (Zephyrus) betulae, with

3 plates containing many figures.

The Ent. Zeit. for September contains a portion of the Faunal

List of Lepidoptera of Upper Styria.

The Mitt. Münch. Ent. Ges. 1931 (1) has a very interesting article on the insular parallel forms in the Genus Papilio, and (2) the Lepidoptera of the Gran Chaco (Argentina), a collection made in 1925-6. Sphingidae by Baron von Rosen, Geometridae by L. B. Prout, and Pterophoridae (Alucitidae) by E. Meyrick.

The Zeit. Oester. Ent. Ver. contains an account of the career of the well-known Dr. Hans Rebel of the Vienna Museum, who has just reached his 70th year. There is a very clear portrait of the Doctor. It is very pleasing to see a portrait of one who has done so much to spread the knowledge of European Lepidopterology for so long a space

of years.

We have recently received the Trans. Ent. Soc. South of England, no. 6. It contains XIV. pp. of Rules, Financial Statement, and List of Members, and 136 pp. of matter made up of four important papers. There are no Proceedings, as in former years. Two papers are on Diptera (1) The "British Species of Asilidae and their Prey" by B. M. Hobby and (2) "British Tabanidae" by E. Rivenhall Goffe, the latter with two plates. These will be reviewed at length in a subsequent number of this magazine. The other two papers are short and deal with Lepidoptera. (1) "Leucania favicolor," a Life-history compiled from the Notes of the late Eustace Bankes with notes, by W. Parkinson Curtis, and (2) "Additions and Corrections to the Lists of Lepidoptera of Hampshire and the Isle of Wight," by W. Fassnidge. The former is a good piece of work, the putting together of scattered private notes and observations in a species not commonly met with, and the latter a necessary completion of two admirable lists published a few years ago, to bring them up to date.

A considerable portion of Heft 3 of Iris is taken up with a consideration of the Micro-lepidoptera. The first article by Dr. Vorbrodt dealing with the Tessin Fauna and the second paper by H.

G. Amsell that of the Mark Brandenburg (Berlin area).

We note that the "Painted Lady," Pyrameis cardui, is reported from as far north in the British Isles as Shetland.

In the Ent. Rundschau for September is a List of the Butterflies found in Haiti from May 15th to June 21st, 1930, some 75 in number,

including 5 Papilio.

We have received an interesting and useful separate of an account published in Trans. Am. Ent. S., the "Cuban Hesperiidae," by R. C. Williams, Jr., with one coloured plate and 14 text figures of genitalia. The collection was made by the Querci family from November, 1929, to October, 1930. There is a table of emergences of each species. 36+5 are dealt with.

A part of the *Lepidopterorum Catalogus* recently issued deals with a second portion of the *Satyridae*. The enormous mass of references collected in this wonderful encyclopedic catalogue is phenomenal. The aid to research afforded by these volumes is of untold value. We congratulate the compilers, editor and publishers on the production of these volumes. That they are comprehensive may be judged from the instance that seven and a half quarto pages are filled with references to *Erebia euryale*.

We quote the following note from the Canadian Ent. "Invaluable

 Words .

"Certain invaluable words and phrases as "apparently," "seems to be," and "it appears," have become to be an almost necessary part of the equipment of scientific investigators and writers. The majority of the articles that come to hand are liberally sprinkled with such words, and perhaps not unnecessarily so. To one unfamiliar with the subject matter of an article or to a tyro in the field, the thought comes that the author is treading as if on thin ice and is hesitant to commit himself by drawing definite conclusions. Doubtless this is true and it is well that it is so, for such an attitude makes for open-mindedness and tolerance. It is ever a dangerous thing to approach the region where opinions crystallize, and such words are buffers of the greatest import. Such loophole phrases offer a way out to investigators and probable often advert disagreements, which many times result in bitter feelings. The words "apparently" and "probably" must serve on numerous occasions as life preservers in the rough experimental waters The importance of the frequent and timely use of such words as "possibly" and "nearly" should be early impressed upon young scientists and authors. John Ray said that "Nature refuses to be forced into the fetters of a precise system" and, with the infinite number of exceptions and yet unexplained variances, a high premium should be placed upon such pertinent tools and indispensible servants to progress in scientific research."

We have received two separates from Dr. U. Rocci (1) A consideration and Discussion of the Mode of Variation in *Melitaea athalia*. (2) General Observations on a few species of Lepidoptera. The former is illustrated by 2 plates giving figures of the two groups into which he divides the various races he has met with in the Ticino area of N. Italy, one of 22 figures of the *melathalia* group and the other of 18 figures of the *divergens* group. Both seasonal (generations) and local variation

is dealt with.

An interesting and useful feature of some of the descriptions of the distribution of the Lepidoptera in the continental magazines is the inclusion of a map. The Ent. Zeit. for October contains such a map of the distribution of Polyommatus meleager in Germany. Herr G. Warnecke in his article shows that there is no connection of the German races with those south of the Alps nor with the S. Western area the French alpine slopes. The same number contains instructions for handling and rearing the cocoons of the larger silk-moths.

As we go to press we regret to hear of the death of W. J. Lucas,

F.E.S., who was well-known as a student of the Orthoptera.

SOCIETIES.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.

EXHIBITION MEETING—OCTOBER 20TH, 1931.—This being the annual Exhibition Meeting was devoted to the inspection of exhibits brought by the members. The scarcity of Lepidoptera in many parts of the country during a remarkably wet, cold and sunless season was commented upon, but those members who had collected in the South-eastern Counties had found insects more numerous, and some good series of local and rare species had been secured. Despite the poor reports exhibits were quite as numerous and varied as usual.

Mr. R. Tait showed bred series of Biston strataria and Asphalia ridens from the New Forest, and from Dorset series of Agriades thetis (bellargus), Polyommatus icarus, Aricia medon (astrarche), Cupido minimus,

Melitaea aurinia and Adscita (Ino) statices.

Mr. W. Buckley exhibited Agriades coridon, A. medon (astrarche) and Chiasmia clathrata from Royston. From Symonds Yat he had Brenthis selene, Leptosia sinapis and bred specimens of Zygaena filipendulae of a dull, greasy appearance. The same member also showed examples of Rumicia (Chrysophanus) phlaeas from Nevin with only a trace of the

usual orange band on the hind wings.

Mr. and Mrs. A. W. Hughes, who had had a particularly productive season, brought a very large exhibit representative of captures made up to July. These included—from localities in Surrey. Apocheima hispidavia, Lycia hirtaria, Hemerophila abruptavia, Ephyra pendularia, Ectropis (Tephrosia) punctulata, Boarmia punctinalis (consortaria), B. roboraria, Comibaena (Euchloris) pustulata, Drymonia trimacula, Toxocampa pastinum, Calymnia pyralina, Dyschorista suspecta and a specimen of Triphaena pronuba with partly bleached fore-wings. From Essex—Brephos notha. From Wye, Kent—Pachetra leucophaea, Mysticoptera (Lobophora) sexalata and Anaitis efformata. From the New Forest—Synanthedon (Sesia) culiciformis (bred), Apamea ophiogramma (bred), Callimorpha dominula (bred), Boarmia cinctaria and Pachyenemia hippocastanaria. From Lewes, Sussex—Acidalia immorata. From the Isle of Wight—Endrosa irrorella, Ptychopoda (Acidalia) humiliata, Ayrotis lunigera, Xylophasia sublustris and Acosmetia caliginosa.

Mr. J. B. Garner-Richards brought an exhibit from the Isle of Wight including Colias croceus and Polygonia c-album and also a golden

variety of R. phlaeas from Formby.

Mr. W. Mansbridge exhibited, on behalf of Mr. A. R. Davidson, a specimen of *Phryxus livornica* captured at Formby in June, and Mr. G. de C. Fraser exhibited one of two specimens of the same species captured at rhododendron flowers in his garden at Freshfield during

the same month.

Mr. R. N. Snell had B. strataria from Dolgelly, a variable series of Nyssia zonaria from Conway and Hibernia leucophaearia from Eastham. From Symonds Yat—Leptosia sinapis, Abraxas sylvata, Anaitis plagiata, Minoa murinata and Cepphis (Epione) advenaria. From Wicken—Arsilonche albovenosa, Phragmatobia fuliginosa and Calamia phragmitidis. From Abbots Wood—Lymantria monacha (including specimens with yellow bodies), Aspitates ochrearia, Drepana binaria and specimens of Nola albula, Eremobia ochroleuca and Lithosia complana, and also bred examples of Pterostoma palpina from Devon.

Mr. H. W. Wilson exhibited a bred series of Callimorpha quadri-punctaria (red, yellow and intermediate forms) from Devon, and from the same County Xanthorhoë rivata and Acidalia imitaria. From Wallasey—Taeniocampa opima and a specimen of Boarmia repandata variety nigricata. From Burnt Wood—Bomolocha fontis and Semiothisa notata, and a long varied series of Calamia lutosa from South Lancashire.

Mr. G. A. Longworth showed specimens of Calocampa solidaginis from Moel Fammau, Dasychira fascelina (bred) from Formby and Hipparchus (Geometra) papilionaria (bred) from Thurstaston.

BITUARY. Edward Step, F.L.S.

There has recently passed from us one of the greatest teachers of Natural History of the last half-a-century. Edward Step was born 76 years ago, and for more than half that period he had devoted the whole of his energy to inculcate a knowledge of the natural beauties of our An ardent lover of the woods, fields, hillsides and commons, an adept photographer of taste and judgment, he gradually acquired an encyclopedic knowledge of our indigenous plants and animals. He early recognised that the more technical language of biological science tended to repel would-be enquirers into nature's mysteries, and in all his work his aim was to present his facts in such easy, and yet not over simple, language that the "man in the street," so to say, readily understood and grasped the truths. To illustrate what he taught he looked upon as a "sine quâ non" of his work, and this his skill and practice in photography successfully achieved. Perhaps the leaning of his study was to Botany; his numerous published volumes on wild flowers, garden flowers, trees and shrubs, and fungi soon became the invaluable handbooks of ramblers in our woodlands, heaths and commons. He joined the South London Entomological and Natural History Society in 1872, the year of its inception, had been its President more than once, and was to have been again in the chair during 1932, its Jubilee Year. But unfortunately this was not to be, and he passed away in mid-November last. Every member of this popular Society esteemed him greatly, for he was rarely absent from its meetings and was also particularly interested and helpful in the field meetings. His writings differ from those of the average bookmaker in natural history, in that they teem with his own actual experiences in the field and many of his illustrations such as those in "Wild Flowers Month by Month," can be recognised by the ardent rambler as pictures of famous beauty spots of the wild Surrey hills. A desire to study the life of the sea shore led him some years ago to reside for a while on Cornwall's rocky coast. of the knowledge so gained we find in his "Shell Life," and his lectures on crabs and other sea creatures were delivered out of the fullness of the knowledge thus gained. London publishers discovered his skill and knowledge and all the best natural history books for years were issued under his editorship. Only one need be mentioned here, and that is the three volumes of "South's Butterflies and Moths of the British Isles," which no British lepidopterist can possibly do without. He will be missed by many a lover of nature throughout the land, but he will still live and teach through his beautiful books.—Hy.J.T.

All MS. and EDITORIAL MATTER should be sent and all PROOFS returned to Hy. J. TURNER, "Latemar," West Drive, Cheam.

We must earnestly request our correspondents not to send us communications identical

with those they are sending to other magazines.

Reprints of articles may be obtained by authors at very reasonable cost if ordered at the time of sending in MS.

Articles that require ILLUSTRATIONS are inserted on condition that the AUTHOR defrays the cost of the illustrations.

EXCHANGES.

Subscribers may have Lists of Duplicates and Desiderata inserted free of charge. They should be sent to Mr. Hr. J. Turner, "Latemar," West Drive, Cheam.

Duplicates .- S. Andrenaeformis, Bred 1928, well set on black pins, with data.

Desiderata .- Very numerous British Macro Lepidoptera .- J. W. Woolhouse, Hill House, Frances Street, Chesham, Bucks.

Desiderata .- Species of Dolerine and Nematine sawflies not in my collection; list sent .- R. C. L. Perkins, 4, Thurlestone Road, Newton Abbot.

Duplicates .- Albimacula*, sparganii*.

Desiderata.—Ova of D.oo. pupae of X. gilvago, D. caesia. A. J. Wightman, "Aurago," Bromfields, Pulborough, Sussex.

Exchanges.-Living Eggs of Catocala fraxini and sponsa, exchange for butterflies of British Isles .- C. Zacher' Erfurt, Weimar, Street 13, Germany.

Duplicates.—Pyralina*, Salicis, Ianthina*, Orbicularia*, Repandata in variety, Doubledayaria, Black rhomboidaria*, Black virgularia* and others.

Desiderata.—Hyale, Welsh aurinia, Polychloros, Tiphon Agathina, Lunigera, Lucernea, Neglecta, Diffinis, Populeti, Gothica v. gothicina, White Leporina, Tridens Putrescens. Littoralis, Typhae v. fraterna, Rurea v. Combusta, Gilvago, Fulvago v. flavescens, Liturata v. nigrofulvata. Harold B. Williams, Woodcote, 36, Manorgate Road, Kingston Surrey.

Duplicates.—Ocellatus* 5, Hastata 1, Cambricaria 3, Blandina 12, Protea* (melanic)

2, Camelina* 2, Dromedarius* 1, well set on black pins with data. Desiderata. Betulae, Trepida, Diluta, Or and Myricae. Geo. Nicholson, 24, Nun's

Moor Crescent, Newcastle-on-Tyne.

Duplicates .- A large number of species of European and Palaearctic Rhopalocera and Heterocera.

Desiderata.—All British species especially those illustrating characteristics of an island fauna. Dr. Lor. Kolb, München 54, Dachauer-str. 409, Germany, and Franz Daniel, München, Bayer-str. 77, Germany.

MEETINGS OF SOCIETIES.

Entomological Society of London.-41, Queen's Gate, South Kensington, S.W. 7.

8 p.m. February 3rd, March 2nd.

The South London Entomological and Natural History Society, Hipernia Second and Fourth Thursdays in the month, at 7 p.m. Chambers, London Bridge. January 28th, Annual Meeting, February 11th.—Hon. Secretary, Stanley Edwards, Avenue House, The Avenue, Blackheath, S.E.3.

The London Natural History Society.—Meetings 1st and 3rd Tuesdays in the month at 6.30 p.m. at the London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, W.C. Visitors admitted by ticket which may be obtained through Members or from the Hon. Sec. A. B. Hornblower, 91, Queen's Road, Buckhurst Hill, Essex.

IRISH NATURALISTS' JOURNAL

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with the

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CONTENTS

The Early Stages of P. globulariae, and of P. cognata, Dr. E. A. Cockayne, A.M., F.E.S. and C. N. Hawkins, F.E.S	17
Stray Visits to Kerry in Search of Moths, Rev. Canon G. Foster, B.D. (concluded)	23
The Specific Names and Geographical Variations of M. parthenoides and M. parthenie, Dr. Roger Verity (concluded)	27
Newly-Described Forms of British Species of Lepidoptera	30
CURRENT NOTES	31
Supprement - British Nocture H J Turner F E S F R H S (213)-(2)	216)

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The Early Stages of Procris globulariae, Hb., and of P. cognata, H.-S.

By Dr. E. A. COCKAYNE, A.M., F.E.S., and C. N. HAWKINS, F.E.S.

On May 2nd, 1931, we went to Lewes to look for larvae of ' globulariae.' On the lower slopes of Cliffe Hill the leaves of Centaurea nigra showed obvious signs that many larvae had been feeding, but we found only a few. Higher up the hill they were much more plentiful, so that presumably most of those lower down had pupated. We found about 140 larvae, of which all but a few were in the last instar and many were nearly full-fed. Most of them were in blisters of various sizes formed by the cuticle of the leaf all the rest having been eaten; others were in the act of eating their way into a fresh leaf; some with nothing but the head inside, and others with a smaller or larger part of the body already hidden. Larvae only partly inside a leaf dropped to the ground as soon as they were disturbed. were cutting a way in from the upper side, but the majority were making a new blister, by entering a leaf from its under side. In one leaf two larvae, both nearly full-grown, were lying side by side in the same blister, but in no other blister was more than one larva found. Three or four larvae were sitting on the central short leaf of the plant, probably full-fed and resting prior to pupation, for they were not changing skin, an operation carried out inside the leaf. Old blisters of all sizes were seen and in many of them the cuticle had turned brown, but not infrequently one was found still showing the shape of the larva that had left it and with the pale green colour of the cuticle unaltered. In such cases a larva was usually found pushing its way in or already inside a neighbouring leaf. Frass was present in strings between the two layers of cuticle in many of the old blisters, for though the larvae extrude some frass, most of it is passed within the blister. The plants of Centaurea nigra are very small with the leaves often few in number, short, and rounded so that they are quite inconspicuous, and the discoloured patches left by the larva are often the first thing to draw attention to them. In some of the smaller leaves a blister occupies the major part or even the whole of the leaf. The larvae were surprisingly active, much more so than those of a Zygaena, rolling themselves into a ball when disturbed and falling, but soon crawling away to a better shelter if exposed to view.

Expecting a green larva we were surprised when the first larva was seen to be greyish-brown and still more so when at the end of the day we had not taken a single green one. Our first surmise as we came home by train was, that two species must occur on the continent both forming blisters in Centaurea and that Buckler must have obtained the wrong one for his figures and description, and on looking at his book found that he obtained eggs in the autumn and larvae in the spring from Herr Heinrich Disqué of Speier. Referring to other authorities it was seen that South, Barrett, and even Tutt had been content to copy Buckler and that all gave the colour of the larva as green. The article in Seitz showed that our guess was very nearly correct.

Dr. Karl Jordan in Seitz Palaearctic Macro-Lepidoptera Vol. II., p. 8 (1909) says that Procris cognata, H.-S., or what he takes to be this

species, is very like globulariae, Hb., differing in the image having longer pectinations to the antennae and in the claspers of the male being narrower and having a long free thorn-like process at the base directed backwards. He goes on to say that it is found in Spain, Italy, France, and the South coast of England, perhaps also in Germany and Austria, and mines in the leaves of Centaurea, especially in C. nigra. Of globulariae he says it is found in all the countries of Europe except the most Northern and that it is not found in England. Meyrick however in his Revised Handbook of 1927, though admitting that globulariae and cognata are distinct, retains the name globulariae for the British species. In all probability it will never be possible to decide which name was applied to the species accepted by Jordan as cognata, but it will avoid endless confusion if his determination is accepted. Rebel Berge Schm. Buch, 9th edition p. 450 (1910) also uses the name cognata for the British species.

Freyer, Neue Beitrage. (1833), I. 119, Pl. 62, gives a figure and description of the larva of globulariae. The figure shows a larva with a grevish-green ground colour, narrow pale yellow dorsal stripe, a row of large black dorsal spots, another lateral row and a red stripe between them, but in the text he says that there is a row of red spots in a light green (hell graun) line. Globularia vulgaris is given as the foodplant. Kirby, European Butterflies and Moths (1882) Pl. 21, fig. 2a, figures a pale green larva with a narrow pale yellow dorsal line, a row of large black dorsal spots and another row of black subdorsal spots and between them a blackish-green band with a red wart on each somite. His description states that the larva is green with reddish warts and two zigzag straw-coloured lines on the back. Centaurea scabiosa as the food-plant. Hoffmann, Schm. Eur. (1893) Pl. 9, fig. 15. has a very similar figure, but the ground colour is not so clear a green and the band between the two rows of black spots is a pale bluish-white so that the red warts show much more distinctly. In the text he says "Grau mit rötlichen Warzen und zwei strohgelben, eckig vortrenden Rücklinien." He gives Centaurea scabiosa and Globularia as food-plants. Spuler, Schm. Eur. (1906) uses the same figure. Hoffmann's figure shows the dorsal black spots as a series of triangles occupying the whole of the anterior and outer part of the dorsum of each somite and uniting anteriorly across the mid-line and laterally, while the lateral row of spots forms a continuous band. seems clear that these authors are all dealing with the same species.

Buckler's figures, and description made from the larvae from Speier on the Rhine are different in many respects. The following comparative account is extracted from Buckler.

"The larva has a green ground colour, the dorsal black spots are rounder and meet neither across the middle line nor laterally, and there is no pale yellow dorsal line shown in the figures or mentioned in the text. The white subdorsal marking inclines to creamy-white, sometimes to yellowish-white, and this is strongly contrasted below by a broadish stripe of dark green." These markings are not mentioned or figured by Freyer, Kirby, and Hoffmann, while Buckler's figures show no red warts and they are not described. If these red warts are the subdorsal tubercles, they are very unlike those of Buckler's larvae, for all the large tubercles in these are green, the dorsal ones being light bluish green set with short fine blackish bristles.

It is not improbable that there are three species of *Procris* with larvae mining in the leaves of *Centaurea*, one with a grey or greenish larva with red warts first described by Schmidt and figured by Freyer, Kirby, Hoffmann and Spuler, another with the bright green larva with red warts figured by Buckler, and third, our British species with a brownish larva, of which I have found no published description or figure.

If the green larvae belong to two species it is probable that a microscopical examination of the skin of blown larvae would show structural differences. The question as to whether they belong to one or two species might be settled by breeding from green larvae with and without red warts and examining the antennae and genitalia of the

two lots of imagines.

Although Jordan pointed out more than twenty years ago that the British species is cognata and not the much commoner Continental species globulariae, he did not mention the larva of either of them, and, with the exception of Meyrick, no British author has taken any notice of Jordan's remarks. Both before and after Seitz published his book all have followed Buckler attributing a green larva to the British species and they have in consequence taken the image to be globulariae. to which this green larva belongs. None of the Sussex collectors, who have been breeding it from time to time for many years, seem to have noticed that the larva they found was quite unlike that described in all our books. It is remarkable that Tutt in his British Lepidoptera copied the old mistake. He must have seen that Buckler's larvae came from abroad, but he never tried to confirm Buckler's account by obtaining larvae from Sussex as he could have done quite easily. The description of the early stages contributed by Chapman is probably correct, but unfortunately the source from which the eggs came is not stated.

The following is a description of our British species, P. cognata.

LAST INSTAR.—Larva of the shape common to Procris and Zygaena, short and stout in the middle, tapering greatly at both extremities. Head very small and flat, nearly black. Prothoracic plate dark brown and shining, 1mm. in length, and 1.5mm. in breadth at the widest The plate is triangular in shape with the posterior margin forming the base of the triangle and the apex directed forward. The apex however is very sharp pointed and the sides are not straight lines. Commencing from the base, the sides run parallel or nearly parallel to each other and to the long axis of the larva for about one fourth of their length, then they curve sharply inwards, and finally curve gently forwards again for about the last third of their length so as to meet at a very sharp angle at the apex. The base is almost straight or is slightly sinuous. A narrow strip of colourless chitin runs up the middle of the posterior half dividing it into two parts. On each side from the anterior end of the straight part of the lateral margin a line runs inwards and forwards, curving first with a convexity and then with a concavity forwards, and these lines form by their junction a very sharp projection in the mid-line pointing towards the head. The portion of the plate in front of these lines is covered with long light brown setae and that behind is bare. The anterior portion of the prothorax is not covered by the plate, but is quite soft and the

head can be retracted almost entirely within it or can be thrust far forward for the purpose of eating out the parenchyma of a leaf.

Legs black. Ground colour pale greyish-brown (grayish olive-Ridgway), appearing darker on the dorsum between the dorsal and subdorsal tubercles and below these tubercles owing to the greater abundance of black dots with which this part of the skin is studded. At the beginning of an instar the larva appears to be very dark because the dots are then close together, but it becomes paler as they separate with the growth of the skin. There are four rows of large tubercles either pink or avellaneous (Ridgway); the dorsal tubercles oval, set obliquely with the anterior ends close together, so that only a small space is left between them and almost touching one another on the 2nd thoracic; the subdorsal tubercles oval with their long axis lying transversely. These lie in the line of the anterior ends of the dorsal tubercles and extend downwards nearly to the spiracles, which are at the level of their anterior borders. Below the spiracles are the two subspiracular There is one tubercle of rows of tubercles, smaller and nearly round. each row on each somite. Hairs of two kinds arise from each tubercle, short ones varying somewhat in size, sharp, smooth, pale brown with dark brown tips, and much longer ones, white or colourless, divided up into numerous short segments each a little wider at the distal than at the proximal end. Small numbers of both kinds of hair are also present on the lower part of each proleg, but both kinds are smaller than on the tubercles.

Just external to the dorsal tubercles is a fairly broad stripe, whitish, cream-coloured, or clear pale yellow, curving inwards towards the middle line in the intervals between the tubercle of one somite and the next and sometimes running up the sides of each tubercle. In some larvae this stripe is bordered externally at a point opposite each tubercle by a narrow bright red line. Anal plate small and dark brown. Prolegs with brown crochets. Spiracles small, oval, and black.

Seen under high magnification ($\frac{1}{3}$ objective) the whole of the prothorax excepting the plate is thickly covered with short sharp black spines pointing backwards and similar spines are also present on the dorsum of the second thoracic and there are also a few low down on the lateral aspect of all the somites, some of them on the prolegs. The black dots, seen with a lens on all somites except the first and second thoracic, are small raised round black chitinous plates, from which arise short blunt spines. These plates vary in size. A few have only a single spine, others have three or four, while the largest have a row of about eight around the margin and three or four in the central part. The central spine is longer than the others and vertical, while the rest point obliquely outwards from the centre. These spiny plates are numerous on all parts above the spiracles with the exception of the subdorsal stripe on which they are scanty, but become very sparse at the level of the subspiracular tubercles.

In addition to these spiny plates the skin, except that of the prothorax, is thickly studded with minute raised dots, much smaller and more numerous than the plates, black where the ground colour is

brown and white on the subdorsal line.

On each somite from the second thoracic to the eighth abdominal, in the mid-line half way between each pair of dorsal tubercles is a small area, apparently a shallow depression, variable in size and shape,

but as a rule nearly oval. These areas are free from the small black dots and the larger spiny plates and are occupied by flat plates of thickened cuticle, each approximately round and outlined by a very narrow wavy brown line. The average number in each area is about ten, but they vary in number and in size. There is also a lateral row of similar areas, one on either side of each somite at the level of the upper border of the subdorsal tubercles and lying half way between one tubercle and the next. These areas correspond with the flat black plates found in the same situations in the larva of Zygaena exulans, on the dorsum of which there are two roughly semicircular ones with posterior ends close together or even touching, and between the subdorsal tubercles a long narrow plate lying at right angles to the long axis of the larva. Exulans however has another lateral row of small round plates at the level of the subspiracular tubercles.

The skin is soft and distensible like that of a Zygaena, but no oily drops are exuded, as they are from many points on the skin of a Zygaena, when it is rolled preparatory to being blown. There appears to be no prothoracic gland. The blood is a rich orange colour like

that of all the species of Zygaena examined.

PENULTIMATE INSTAR.—In all respects the same, except that no larva with a red line bordering the subdorsal stripe was met with.

COCOON AND PUPA OF PROCRIS COGNATA, H.-S.-When full-fed the larva rests for some time, often as long as three or four days, on the ground or some object such as a stem or leaf of the food-plant. then buries itself just beneath the surface of the ground, travelling along for a short distance, frequently pushing up the surface of the earth into a little mound above it. Next it spins the grains of earth above it into a kind of cover with strands of soft silk, which may also occasionally be attached to a leaf of the food-plant or other object lying on the earth beneath it thus forming a fragile outer elongated oval cocoon of earth, which is subsequently strengthened by spinning a layer of silk all over the inside. Within this outer cocoon is an inner one formed of soft but fairly tough pale brownish-grey silk (not greenish-white as described by Buckler and Hofmann, but agreeing very nearly with Zeller, who describes it as "braun-grauen"), closely woven and lightly attached to the outer cocoon, with little nodules of pure white silk here and there in the texture. Very rarely a larva will in captivity form its cocoon upon some object just above the surface of the ground, but these cases are probably due to some abnormal circumstance such as disturbance by another larva. Upon emergence of the imago the pupal skin is often withdrawn entirely from the cocoon and left lying loose on the ground, but this is certainly not always the case. Usually the empty pupal skin is left projecting from the cocoon as in Zygaena. The dehisced pupa is fairly transparent, very pale brown in colour, and evidently thinly chitinized. At the same time it is of reasonably stout substance and does not usually lose shape badly on emergence of the imago.

The male pupa is 11.5 to 12mm. long and nearly 4mm. wide outside the wings at the widest part, the third abdominal somite, while the female is about 1mm. less in length, but of stouter build, that part of the abdomen not covered by the wings being considerably stouter than in the male. Chapman's description of the pupa under the name globulariae as quoted by Tutt in Brit. Lepidopt. Vol. I. pp. 412-3,

appears accurate so far as it goes except that the number of "fine brown spinous points" forming the dorsal rows of spines near the anterior margin of the abdominal somites 2 to 9 varies from 10 to 24 on each side in a female and from 8 to 18 in a male according to the width and position of the somite instead of from 14 to 18 as mentioned by A few further details can however now be given from an examination of dehisced pupae. The dorsal head-piece is well developed, as long as the prothorax, or even longer, at the sides and shortening toward the centre-line to about one third of that length. Epicranial suture distinct and effective on dehiscence, leaving the dorsal headpiece attached to the prothorax. Prothorax short and of nearly the same length throughout its breadth, but becoming slightly shorter towards the external margins and in the middle. Mesothorax rather more than three times the length of the prothorax at the sides and about four times the length at the mid-line, there being a large backward projection into the area of the meta-thorax. Metathorax comparatively short, about half the length of the meso-thorax at the sides and shortened by nearly half in the middle by the backward projection of the mesothorax. On dehiscence all these parts separate partially from each other and from the abdomen and usually slide over one another to a certain extent, which makes accurate measurement The dorsal head-piece and prothorax divide completely down the centre-line and the meso-thorax divides nearly but not quite to the posterior margin. With regard to the head parts, the front is placed well forward and there is no visible fronto-clypeal suture. does however appear to be some trace of a suture between the clypeus and labrum although it is only a faint line. The invaginations for the anterior arms of the tentorium are slit-like and of considerable size. The labial palpi are either not visible at all externally or they are reduced to two minute knobs at the posterior margin of the labrum, probably the former, in which case the labrum appears to extend slightly over the bases of the maxillae. Mandibles are clearly indicated and consist of raised irregularly oval roughened areas at the posterolateral angles of the labrum. The maxillae are long and reach to about the posterior margin of the 6th abdominal somite or a little further, as also do the tarsi of the 3rd pair of legs. The tarsi of the 2nd pair of legs and the antennae are much shorter and reach barely to the posterior margin of the 4th abdominal. The meso-thoracic wings are about 5mm. long in the female and slightly longer in the male. There is one other point about Chapman's description as quoted by Tutt which appears to need correction. He says there is no definite trace of maxillary palpi. In fact there is, just outside the sculptured eye-piece on each side, a curious little knob-like projection, which appears under the microscope and by transmitted light to show distinct signs of segmentation, the apparent number of segments being three, and a basal part extending to the outer angles of the maxillae. There would seem no doubt that these are maxillary palpi.

As Chapman says there is no cremaster nor anal armature of any description nor are there any setae or spines whatever on any part of the pupa, except the dorsal rows of spines on the abdominal somites. The spiracles on the 8th abdominal are placed very far back, almost at the posterior margin of the somite, and are very prominent par-

ticularly in the female.

The date of emergence is much influenced by temperature, for from the pupae kept in an unheated room in London, imagines appeared from June 11th to June 18th with the exception of two belated ones; whereas from those taken on June 2nd to Braemar, where the weather was cold, the imagines appeared from June 27th to July 5th. Emergence generally took place in the afternoon.

Only two larvae were parasitized. A single specimen of *Cremastus bellicosus*, Gr., an Ophionine ichneumon was bred from one, and several *Apanteles* (probably) *geryonis*, Marshall from the other. Our thanks are due to Mr. Claude Morley, who identified the former, and to Mr.

K. G. Blair who identified the latter.

Stray Visits to Kerry in Search of Moths.

By CANON G. FOSTER, B.D.

(Concluded from page 4.)

NOCTUIDAE.

Pharetra (Acronicta) rumicis, L.-Kells.

Agrotis segetum, L.—Blackwater, Oct., 1908.

A. vestigialis, Hufn.—Abundant on the flowers of the bent grass, at the Inch sandhills, July, 1905.

A. corticea, Hb.-Inch, 1905.

A. nigricans, L.—Glenbeigh, August, on ragweed.
A. tritici, L.—Abundant at Glenbeigh, on ragweed.

A. obelisca, Hb.—Glenbeigh.
A. strigula, Thnb.—Glenbeigh.
Noctua rubi, View.—Glenbeigh.

N. xanthographa, Fb.—Glenbeigh. Axylia putris, L.—Inch, July, 1905.

Triphaena interjecta, Hb.—Glenbeigh, abundant on ragweed in

August.

Mamestra persicariae, L.—One came in to light, June 1928, Valentia; persicariae is very scarce in Ireland, and this is the only occasion I have met with it.

M. brassicae, L.—Valentia, June, 1928.

Apamea gemina, Hb.—Valentia, June, 1928.

Hadena pisi, L.—Caterpillar often to be seen on rushes, etc., in August.

H. nana (dentina ssp.)-—Sitting on rocks in daytime, Valentia, West cove, June, 1928; also at sea campion by night.

Apamea oculea, Gn.—Generally abundant.

Dianthoecia cucubali, Fues.—Abundant. Darrynane, June, 1928, also on sea campion at Valentia same date. Here (Strangford) I have never seen it at sea campion; its place is taken by D. conspersa, Esp., which I did not see at Valentia, or anywhere in Kerry. D. cucubali here keeps to 'ragged robin.'

D. carpophaga, Bork.—I have never seen a typical carpophaga in Ireland, but capsophila, Dup., is abundant on every part of the coast I have worked; e.g., Strangford and Ardglass, Down; Ballintoy, Antrim; Howth, Dublin; Greystones, Wicklow; Valentia and Inch, Kerry. The darkest, and those with the obscurest markings, were from Inch, Kerry, in late July.

15.II.1932

Cleoceris viminalis, Fb.—While beating for caterpillars at Glanleam, Valentia, a specimen dropped into the umbrella, June 1928.

Xylophasia rurea, Fb.—Valentia, June, 1928.

Phlogophora meticulosa, L.—Blackwater, Oct., 1908.

Hydroecia nictitans, Bork.*—Darrynane, on window of Hotel. I have not had an opportunity in recent years of visiting Kerry when this insect was on the wing, but it used to be abundant at Glenbeigh.

Leucania litoralis, Curt.-Inch, July, 1905, abundant on sandhills.

L. conigera, Fb.—Inch, July, 1905.

Caradrina alsines, Brahm.—Inch. July, 1905.

C. taraxaci, Hb.—Inch, July 1905.

C. quadripunctata, Fb.—Common everywhere.

Amphipyra tragopagonis, L.—Glenbeigh.

Dyschorista iners, Tr. (suspecta, Hb.)—Glenbeigh.

Amathes lota, Clerck.—Blackwater, Oct., 1908; Valentia, larva, June, 1928.

A. macilenta, Hb.—Blackwater.

A. circellaris, Hufn.—Blackwater.

Xanthia lutea (flavago, Fb.)—Sneem.

Orrhodia vaccinii, L.—Blackwater.

Xylina socia, Rott.—Blackwater, Valentia, June, 1928, larva.

X. ornithopus, Rott.—Blackwater.

Calocampa exoleta, L.—Blackwater.

C. vetusta, Hb.—Blackwater.

Erastria fasciana, L.—Caragh, June, 1912. Glencar, June, 1928; abundant.

Phytometra viridaria, Clerck.—

Plusia bractea, Fb.—Inch, July, 1905.

P. gamma, L.—There seemed to have been an invasion of Kerry by gamma, in June, 1928. They rose in clouds as you tramped through the heather and made it difficult to fix the eye on anything else. They must have been in thousands. Strange to say there was also an invasion of two other insects, Nonophila noctuella, Schiff., and Scopula ferrugalis, Schiff. Usually of these last two but odd specimens turn up here, but in June, 1928, they were ubiquitous in Kerry. And when I returned home here (Co. Down) N. noctuella was equally plentiful in this district, while Scopula ferrugalis was far more so than usual. P. gamma, of course, is a migrant, but why these other insects so abounded I do not know. P. gamma here is frequently to be captured hovering over the sea-campion in early June. Later its place is taken by Plusia iota, P. pulchrina, and P. festucae. But when they go it appears again at ragweed and ivy. In Belfast I have reared a caterpillar which was found on a geranium leaf in a greenhouse during September.

Habrostola tripartita, Hufn. - Abundant, Valentia, June.

H. triplasia, L.—Abundant, Valentia, June.

Euclidia mi, Clerck.—Kells and Darrynane, frequent.

Zanclognatha tarsipennalis, Tr.-Inch, July, 1905.

Z. grisealis, Hb.—Valentia, June, 1928.

Bomolocha fontis, Thnb.—Abundant at Caragh and Glencar.

^{*} crinanensis?-E.A.C. Some since identified are crinanensis.-Hy.J.T.

GEOMETRIDAE.

Hipparchus papilionaria, L.—Caragh, July.

Iodis lactearia, L.—Caragh, June, 1912.

Hemithea aestivaria (striyata, Müll.)—Came to light, Inch, 1905.

Ptychopoda biselata, Hufn., and P. dimidiata.—Generally abundant. Acidalia floslactata (remutaria, Hb.)—Caragh, June, 1912.

Commission and Maria Clark Carach Inno 1019

Cosymbia pendularia, Clerk.—Caragh, June, 1912.

Ortholitha mucronata (plumbaria, Fb.)—Abundant on the hills in June.

O. chenopodiata (limitata, Scop.)—Abundant everywhere in August. Lygris pyraliata, Fb.—Abundant. Inch. July.

Cidaria fulvata, Forst.—Inch, Glenbeigh, June, July.

Euphyia corylata, Thnb.—Caragh, May and June, much lighter coloured than Perthshire specimens.

Dysstroma truncata, Hufn.—Valentia, June, 1928.

Calostigia pectinitaria (viridaria, Fb.)—Abundant in June, e.g., Caragh, 1928.

Entephria caesiata, Schiff.—Glenbeigh, June, 1928. Xanthorhoë montanata, Bork.—Generally distributed.

Epirrhoë galiata, Hb.—Darrynane, June, 1928.

E. alternata (sociata, Bork.)—Caragh.

Euphyia unangulata, Haw.—Inch, July, 1905.

Eulype hastata, L.—Abundant, Caragh, June, 1912, caterpillars on tips of bog myrtle at Sneem, September; on birch, Glenbeigh.

Mesoleuca albicillata, L.—Inch, Caragh, Valentia, June and July.

Perizoma albulata, Schiff.—Valentia, Darrynane, June.

P. blandiata, Hb.—Abundant on the hill, "Devil's Elbow," Caragh, June, 1912 and 1928.

Euphyia bilineata, L.—Abundant, June-July.

Hydriomena coerulata, Fb. (impluviata, Hb.)—Valentia, June, 1928.

Eupithecia pulchellata, St.—Valentia, June, 1928.

E. succenturiata, L.—Inch, July.

E. venosata, Fb.—Valentia, June, abundant.

Orthonoma obstipata, Fb. (fluviata, Hb.)—Two specimens on Ivy, Oct., 1908, Blackwater.

Bapta bimaculata, Fb.—Abundant at Caragh, May and June, 1912.

B. temerata, Hb.—Caragh, June, 1912 and 1928.

Anagoga pulveraria, L.—Caragh and Glencar, June, 1912.

Selenia bilunaria, Esp.—Valentia, June, 1928.

Phalaena syringaria, L.—Caragh, July.

Gonodontis bidentata, Clerck.-Valentia, June, 1928.

Crocallis elinguaria, L.—Caragh.

Plagodis dolobraria, L.—Caragh, June, 1912.

Pseudopanthera macularia, L.—Abundant at Oulagh Lake, Caragh, June, 1912. The Caragh specimens are much deeper yellow than those taken at Rathdrum, Wicklow, 1925. Perhaps they are descended from an earlier and more ancient colonisation of Ireland.

Semiothisa notata, L.—Caragh, June, 1912. Also June, 1928.

S. liturata, Clerck.—Caragh, June, 1912.

Biston betularia, L.—Ballymac Elligott, July. I have not seen carbonaria (doubledayaria) in Ireland, though taking betularia in Cos. Kerry, Armagh, Down, and Antrim.

Boarmia rhomboidaria, Schiff. (gemmaria, Brahm.)—Valentia, Inch.

B. repandata, L.—Valentia, June, 1928.

B. consonaria, Hb.—Very local where it does occur. Robert's Island, Caragh, June, 1912; Glanleam Woods on left, Valentia, June, 1928.

Ectropis punctulata, Hb.—Abundant, Caragh, June, 1912.

Ematurga atomaria, L.—On all heaths in June..

Bupalus piniaria, L.—Abundant, Caragh, June, 1912.

Lithina chlorosata, Scop. (petraria, Hb.).—Abundant, Caragh, May

and June, 1912. Valentia, June, 1928.

Chiasmia clathrata, L.—I took a specimen in the train while returning from a visit to Kerry, but cannot maintain it came on board in Kerry. Of course clathrata is locally abundant in many Irish counties, e.g., Antrim and Armagh.

ZYGAENIDAE.

Zygaena filipendulae, L.—Is abundant on sandhills, e.g., at Inch; also Valentia, June, 1928.

Procris statices, L.—Inch, July, 1905.

HEPIALIDAE.

Hepialus hectus, L.—Glencar, June, 1928.

PYRALIDES, ETC.

Eurrhypara urticata, L.—Inch, July, 1905.

Botys fuscalis, Schiff.—Darrynane, June, 1928.

Scopula lutealis, Hb.—Abundant everywhere, August.

S. ferrugalis, Schiff.—Abundant, Valentia, Kills, Darrynane, June, 1928.

Nomophila noctuella, Schiff.—I was interested to notice that Major Graves comments on the abundance of noctuella July, 1928. Apparently the June swarms which I met with continued undiminished into July. Kills to Darrynane, June, 1928. Killarney, September, 1904.

Scoparia dubitalis, Hb.—Valentia, June, 1928.

S. crataegella, Hb.—Glencar.

Schoenobius forficellus, Thnb.—I did not meet with it in Kerry, but used to take it abundantly in the drains, locally called "guts," running into Lough Neagh, west of Lurgan, Co. Armagh, in July, 1904 and 1905.

S. mucronellus, Schiff.—Inch, July.

Crambus pascuellus, L.—Abundant at Glencar, June, 1928.

C. perlellus, Scop.—Inch, July, 1905.

C. geniculeus, Haw.—Sandhills at Darrynane, June, 1928.

Homoeosoma binaevella, Hb.—Inch, July.

Aphomia sociella, L.—Valentia, June, 1928. The Miss Delaps have uncarthed the nest of a bumble bee of sorts, and it was crowded with the cocoons of sociella. These kept emerging throughout the month of June.

TORTRICES.

The list of Tortrices is short since I have not had them verified. Tortrix viridana, L.—Glencar, June, 1928.

Capua favillaceana, Hb.—Inch, July. Sericoris micana, Haw.—Caragh, June.

Aspis udmanniana, L.—Inch and Valentia, June and July.

Cnephasia chrysanthemana, Dup.—Inch, July.

Mixodia schulziana, Fb.—Inch, July. Laspeyresia aurana, Fb.—Inch, July.

Excluding the Tineina something about 600 species of lepidoptera have been recorded for Kerry. This list therefore, 166 or so, only amounts to about one quarter. Many exceedingly common insects are omitted, and a fair number are new records for Kerry. A resident Entomologist working the year through would no doubt enlarge the list immensely and in all probability make important discoveries. It was only during three visits that I have done any serious work. These took in, the end of May, June, and 10 days towards the end of July, while my last visit was rendered almost hopeless by incessant wet weather.

The specific names and the Geographical Variations of Melitaea parthenoides, Kef. (=parthenie, auct. nec Borkh.) and of parthenie, Borkh. (=aurelia, Nickerl).

By ROGER VERITY, M.D.

(Concluded from p. 189, vol. XLIII.)

We next come to the group of races, which fly on the southern watershed of the Alps. One of its peculiarities is that at low altitudes it produces a second generation at the end of August, often quite as abundant as the first of May or June. Taken as a whole, this group differs in a comparatively very distinct way from all those described above: the wings are, on an average, shorter and rounder at the apex; the fulvous is more even in tone and thus less variable both as regards the different parts of the wing surface and the various individuals; the black pattern is, on the contrary, less uniform and notably the central elbowed row of spots tends to form a broad band, across all the wing (never broadened at the back of the cell of the forewing into a triangular patch, as it is particularly in nigrobscura), whereas the premarginal bands tend to be thinner. These features all contribute to give the races of this group a more athalia- and parthenoides-like aspect than one ever finds in the others, and some individuals may even be so very like these species as to make it quite difficult to separate them without the aid of the genitalia. My experience is that the fulvous colour of the palpi, which is considered the best distinctive feature of parthenie = aurelia, is not sufficiently sharpe and constant to be reliable in all difficult specimens. It must also be noted that there is a certain parallelism between these features of the southern Alpine watershed and those which distinguish the athalia of the same regions from the nominotypical one of Central Europe.

Race mendrisiota, Fruhst., l.c. The dry mountains of the Canton Tessin (typical from 600 m. on Mount Generoso, south of Lugano, and of June) produce the race with the thinnest black pattern known in the species: in the males the inner premarginal streak goes so far

as to be entirely obliterated in some individuals, so that they might easily be taken for varia, M.-D.; the females are very similar to that form of rhaetica, which has a thin black pattern, because the fulvous can be, as in the latter, either replaced by light yellow or by reddishbrown, but on the other hand, they differ from it in that the two colours are never combined together; the light-coloured females recall those of parthenoides, the darker-coloured those of athalia; both are transitional between the appearance of aurelia and that of luceria from the Cogne valley; mendrisiota differs more from aurelia than does rhaetica and what distinguishes it from luceria is the regularity of the rows of spots over both fore and hindwing.

Race imitatrix, nom. nov.: The race, which is broadspread in the Susa Valley, whence I have a large series of specimens from Oulx, 1100m., and others from Mount Musinè, 1000m., at the entrance of that valley and only a few miles from Turin, certainly cannot be called luceria as defined below. It is the one which M. britomartis, Assm. race aureliaeformis, Vrty, from the Venaria park of the latter locality so exactly resembles that the genitalia are the only possible way of distinguishing them. The late Reverdin has dissected those of all my males from Mt. Musinè and several I sent him direct from Oulx, in hopes we might discover a new locality of britomartis, but the result was they all turned out to be the species we are dealing with here.

Allowing for the usual very great variability in every respect, race imitatrix, taken as a whole, can be described as being of small size, of a rich tone of fulvous and as having a rather heavy black pattern, comparatively with the other races of the southern Alpine water shed; it thus is exactly the opposite of luceria by all three of these features and it resembles britomartis on this account, even the difference of thickness between the elbowed band and the two premarginal not usually being as accentuated as in the other races just mentioned. Only about 6% of both sexes can be considered transitional to luceria by their larger size, clearer and brighter fulvous and by the thinner and less uniform black pattern; the females nearly invariably belong to the form which resembles the male most and only 5% point to the one characteristic of rhaetica by having a broad black suffusion over the basal half of the wings and the fulvous alternately reddish and yellowish, to the degree which is frequent in poenina.

Race luceria, Fruhst., Archiv für Naturgesch., 1916, A., 2, p. 11 (1917): The original description is anything but a happy one and the further comment in the Archiv of 1917 (publ. 1919), l.c., only adds to its vagueness and confusion. Fruhstorfer at first only had six specimens, he had collected above the village of Cogne at 1650m. "They constitute," he says, "the most striking form of aurelia we are hitherto acquainted with from Europe; their appearance is that of true children of the south, on account of the brightness of the yellow-brown spots and of their breadth, which is more than double. These specimens are so much more remarkable than 36 I have from Martigny, the Simplon and the Barmsee, in Upper Bavaria, that they are nearly exactly like Seitz's figure of mongolica, Stdgr. on pl. 66h." He adds that luceria is probably a transition to the "aurelia" recorded by Rocci from Turin, but we, of course, now know, these are M. britomatis, Assm.

on the strength of the genitalia. In 1919 he complicates matters by describing a "lowland form" of luceria, based on males collected in August in the Brianza (hill district of Lombardy) and on spring specimens from Salsomaggiore (province of Parma), which are said to be of a still brighter leather-yellow and with thinner black streaks than the Cogne examples. Turati informs me he has three specimens of the Soldo, near Alzate (Brianza), collected in May and June 1875. The Salsomaggiore example evidently must have belonged to the following race, which had already been named three years previously from a locality about 30 miles further east and likewise nearly in the plain, at the foot of the Apennines. Excluding, as it should be done, the latter lowland race, one can positively take it that the name of luceria must stand for a large Alpine one resembling Seitz's figure of mongolica, Stdgr. This sets it on a tolerably definite base.

Race mussinae, Costantini, Atti Soc. Nat. Modena (5) 3, p. 14 (1916) has been described from La Mussina, near Borzano (prov. of Reggio Emilia). It is said to be abundant there in June and it is described very unsatisfactorily as follows; "a little larger; wings slightly rounded; upperside of wings more fulvous; underside wholly yellower; black pattern, whitish bands, premarginal lunules, ex., different." Some photographic plates the author has sent me show that he compared his specimens with a few from Vienna and fortunately I have also obtained some of his cotypes of both sexes collected on June 11th and a female of June 15th from Mount Gibbio 400m., a few miles further east, near Modena. All doubts are thus removed as to mussinge belonging to this species, except for a remote possibility that they should be britomartis; this will have to be decided by the dissection of the genitalia, but it compares so much better with the second generation of the race of the Carso and to some specimens of Oulx than to aureliaeformis, Vrty, of Turin, that I feel quite sure this is not the case. As a matter of fact it only differs from the second generation of the Carso by its larger size (not equal, however, to that of the first one) and by the black pattern being thicker than in the darkest specimens of the latter; on the other hand it is far from being as dark as many imitatrix of Oulx, so that the general aspect of the race can be described as intermediate between the two. seems very likely that a second generation will be found to exist in Emilia, as it does in Brianza, according to Fruhstorfer, and on the Carso.

Race carsicola, nom. nov., and II gen. postcarsicola, nom. nov: One is rather surprised at the fact that this species thrives on the dry tableland of the Carso, at about 300m. above Trieste. The first generation flies at the end of May and I have myself collected the second emerging abundantly in late August on the slopes, facing northward, near Opcina. The spring generation attains a larger size than I have seen in any other race, some males having forewings of 18mm. in length, whereas the late summer generation produces some extremely minute individuals of only 14mm. The usual size is 17mm. in the first and 16mm. in the second, and, trifling as this difference may seem, it corresponds to quite a marked one in the aspect of the whole insect. A feature which strikes one in both generations is the far lesser

variability than in other races. The shape of the wings is quite the rounded, athalia-like one, of the southern watershed of the Alps. So is the very uniform and even tone of the fulvous, which is rather clear, but decidedly dull; it is lighter and a little brighter in the second So is also the pattern: the central elbowed band is broader, the outer ones narrower, but they are all of the same even breadth across the whole wings and the premarginal ones are very straight and regular; in a few exceptional individuals the inner one is partly or nearly entirely obliterated, but these specimens then stand out amongst the rest, for there is no tendency to vary in this direction, as there is in the very variable mendrisiota. The few individuals which occur in both sexes with an extremely thin pattern are also of a very light vellow-fulvous and give one the impression of being aberrations due to the excessive drought. As a rule the females belong to the form most similar to the male, as it is the case in all the driest localities of the species, and thus contribute to increase the uniform aspect of the race as a whole. The darker forms of the species never occur in either sex, as they do further east, in Austria. The second generation. besides being considerably smaller than the first, also exhibited on an average, a thinner black pattern and a lesser and lighter coloured basal suffusion, accompanied by a paler tone of fulvous, so that on the whole there is quite a notable difference. Stauder figures three specimens from this region in the Zeit. wissenschaft. Insektenbiolig, 1922, p. 83, but in the text the figures referring to them are mistaken: fig. 12 represents the very small size to which the second generation is often reduced, 13 is quite an abnormal form, with the pattern partly obliterated, 14 is an unusually small female of the first generation. but it shows the thin and even black pattern reduced to the utmost extent: I have found one of the same sort, but smaller, in the second generation.

Newly-described Forms of British Species of Lepidoptera.

Euchloë cardamines ab. subflavopicta, Mezger.—" The underside of the forewings have a yellow spot, between the discoidal and the outer margin, of variable shape in different examples." Hungary. Lamb. XXXI. 115 (1931).

Mimas tiliae ab. vitrina, Gehlen.—"With a round transparent spot on both hindwings symmetrically placed." Ent. Zt. XXXV. 204 (1931).

Melitaea aurinia ab. tetramelana, Cabeau.—"The yellow basal portion of the hindwings has four large black spots instead of the typical pale yellow spots." Lamb. XXXI. p. 174 (1981).

Mimas tiliae ab. griseothoracea, Cabeau.—"The thorax is entirely

whitish grey." Lamb. XXXI. p. 174 (1931).

Melanargia galathea ab. nigerrima. Kautz.—"Upperside almost markingless black, with normal white fringes chequered at ends of the veins with black. The forewings with a somewhat grey-whitish suffusion; above the middle of the inner margin in cells 1b and 2 there stands a spot divided by the black vein 2; in cell 2 there is also a small spot seen. The hindwings whitish on the inner-margin, the white of the disc of zigzag shape; bestrewn thickly with fine grey scaling." Zeit. Oestr. Ent. Ver. XVI. 86, plt. IV. (1931).

CURRENT NOTES AND SHORT NOTICES.

A meeting of the Entomological Club was held at "Durandesthorpe," 19, Hazlewell Road, Putney, on December 17th, 1931, Mr. H. Donisthorpe in the Chair. Members present in addition to the Chairman: - Messrs. Robert Adkin, H. Willoughby Ellis, Jas. E. Collin, W. J. Kaye, Dr. Harry Eltringham. Visitors present:-Sir T. Hudson Beare, E. C. Bedwell, K. G. Blair, Capt. A. F. Hemming, Dr. Karl Jordan, G. C. Leman, Martin E. Moseley, Wm. G. Nelson, Capt. N. D. Riley, and W. H. T. Tams. The meeting was called for 6.30 p.m. On arrival the members and guests were received by Mr. and Mrs. Donisthorpe, when light refreshments were dispensed in the Drawing-Room. The Chairman's collections were on view, and he specially exhibited two living ant colonies and his collection of British The Windsor Pilot Files compiled by the Chairman, recording a very large number of interesting insects, which during many years he has collected at Windsor Forest, created much interest. Supper was served at 8 o'clock, and the very enjoyable meeting was continued to a late hour.—H.W.-E.

The Can. Ent. for October contains an interesting article "The Reactions of Some Insects to Rain." Observations were made on the action of bees and butterflies on the advent of sudden and violent storms and these were compared with the reactions caused by artificial similar showers from a hose and sprinkler. In spite of the absence of the darkening of a heavy cloud in the latter case the insects responded in the same way and hastened to shelter at once. The reaction is distinctly different from the sudden flight which takes place if the insects recognise the movement of one's own person.

In the *Ent. Rund*, for November, Herr H. Beuret discusses the biology and systematic position, etc., of *Plebeius ismenias* under a generic name *Lycaenides*. We have seen this species put under the generic name *Lycaeides*. The Plebeiids seem to be unfortunate in the

hands of the nomenclator both specifically and generically.

Two further parts of the Catalogue of Indian Insects have recently appeared. Pt. 21, The Lycidae (Col.) by R. Kleine and Pt. 22, Phaloniidae and Chlidanotidae (Lep.) by T. Bainbrigge Fletcher the

Imperial Entomologist.

Parts 28 and 29 of the Supplement to Seitz Fauna Palaearctica are to hand. Pt. 29 contains additions to Rumicia phlaeas, Aricia astrarche (medon), Polyommatus icarus, P. coridon and Pamphila palaemon, etc., and a large portion of the Index to the Rhopalocera. Pt. 29 is a continuation of the volume of additions to the Bombyces some fifteen of which are of British species. The correction of lubricipeda to lutea is made but the necessary corollary, the correction of menthastri to lubricipeda, has not been made. Of Lithosia pygmaeola M. Drauat suggests that it is a genuine species although in the main volume it was classified under pallifrons. This last was definitely proved by Messrs. Kettlewell and Tams in our January number. There is a long discussion of the various forms of Coscinia cribraria and also of Parasemia plantaginis. Phragmatobia fuliginosa has a long paragraph devoted to it. Among the other British species dealt with are Miltochrista miniata, Philea irrorella, Oeonistis quadra, Utetheisa pulchella and Lithosia caniola. There is a coloured plate of 67 figures very well pourtrayed.

There is an excellent portrait of Auguste Forel the great student of Ants in the November Mitt. Deutsch. Ent. Gesell.

On the evidence of reports in most of the continental journal there have been captures and observation of *Phryxus* (*Celerio*) livornica in many places throughout Europe. In Lamb. for November last there is an interesting and useful summary of the distribution, occurrence and life-history of this species. The plate in this number contains figures of 4 forms of *Aglais urticae*, viz., ab. leodiensis, ab. nigricaria, ab. victori (melanic), and an albinistic form.

We have received a copy of a new journal, Stylops, promoted by the Entomological Society of London, to be issued monthly. "primarily designed to meet the demand for the prompt publication of short (and purely) taxonomic papers" we are told, and preference will be given to "short" communications of that description. trust that our three current British entomological journals will not be adversely affected by this new periodical. The late founder and editor of the Ent. Record decided to publish on the 15th of the month in order to facilitate the "more prompt publication of new entomological matter," since the two other magazines came out on the 1st. our present current magazines give opportunity for prompt publication By far the greater number of both British and continental students of the palaearctic fauna will either be ignorant of this journal or unwilling to subscribe 24s. to a journal of which the bulk of the contents will be of no interest to them. We trust that all palaearctic taxonomic matter will be excluded. And specifically we protest against the inclusion of the description of a new palaearctic Lycaenid in the present issue. We believe that nearly all the contents will be exotic matter and in that way the journal will doubtless be very acceptable to all centres of economic entomological activity. But all short palaearctic taxonomic matters would have much greater dissemination if sent to either the Entomologist, the Entomologist's Monthly Magazine or the Entomologist's Record. Needless to say the journal is well produced, as one would expect under the auspices of the Entomological Society of London with its able Secretary, Dr. S. A. Neave, who acts as editor.

The annual portly volume from Portici has recently come to hand, Boll. Lab. Zool. Gen. e Agraria, the XXIVth of its issue, consisting of some 340 pp. 150 figures and 4 plates. It is astonishing what a wonderful run of interesting and useful memoirs are issued from this institution year by year. The subjects of these deal with Isopods, Pseudoscorpions, Psyllidae, Chermidae, Tinea, the Honey-bee, Coccids, Coleoptera, Ants, Chalcididae, Thysanura, etc. The whole of the papers are well illustrated, most of the "figures" being composite ones. To lepidopterists the history of Ptychopoda herbariata will be very interesting and is illustrated by no less than 73 diagrammatic figures. The matter is dealt with under the following headings:—Systematic position and nomenclature: adult (head, thorax, abdomen): ova: larva (head, thorax, abdomen) at hatching: ditto at maturity: pupa: description of life and habits (date of appearance, copulation, oviposition, number of ova, etc.): plants attacked by larva: economic considerations: bibliography. A very thorough and comprehensive study. Four of the 21 memoirs are contributed by Signor Sylvestri, five by Signor Boselli, the memoir on ants is by W. M. Wheeler.

All MS. and EDITORIAL MATTER should be sent and all PROOFS returned to Hy. J. TURNER, "Latemar," West Drive, Cheam.

We must earnestly request our correspondents not to send us communications identical

with those they are sending to other magazines.

Reprints of articles may be obtained by authors at very reasonable cost if ordered at

the time of sending in MS.

Articles that require ILLUSTRATIONS are inserted on condition that the AUTHOR defrays the cost of the illustrations.

EXCHANGES.

Subscribers may have Lists of Duplicates and Desiderata inserted free of charge. They should be sent to Mr. Hy, J. Turner, "Latemar," West Drive, Cheam.

Duplicates .- S. Andrenaeformis, Bred 1928, well set on black pins, with data.

Desiderata.—Very numerous British Macro Lepidoptera.—J. W. Woolhouse, Hill House, Frances Street, Chesham, Bucks.

Desiderata.—Species of Dolerine and Nematine sawflies not in my collection; list sent.—R. C. L. Perkins, 4, Thurlestone Road, Newton Abbot.

Duplicates .- Albimacula*, sparganii*.

Desiderata.—Ova of D.oo. pupae of X. gilvago, D. caesia. A. J. Wightman, "Aurago," Bromfields, Pulborough, Sussex.

Exchanges.—Living Eggs of Catocala fraxini and sponsa, exchange for butterflies of British Isles.—C. Zacher' Erfurt, Weimar, Street 13, Germany.

Duplicates.—Pyralina*, Salicis, Ianthina*, Orbicularia*, Repandata in variety, Doubledayaria, Black rhomboidaria*, Black virgularia* and others.

Desiderata.—Hyale, Welsh aurinia, Polychloros, Tiphon Agathina, Lunigera, Lucernea, Neglecta, Diffinis, Populeti, Gothica v. gothicina, White Leporina, Tridens Putrescens. Littoralis, Typhae v. fraterna, Rurea v. Combusta, Gilvago, Fulvago v. flavescens, Liturata v. nigrofulvata. Harold B. Williams, Woodcote, 36, Manorgate Road, Kingston Surrey.

Duplicates.—Ocellatus* 5, Hastata 1, Cambricaria 3, Blandina 12, Protea* (melanic) 2, Camelina* 2, Dromedarius* 1, well set on black pins with data.

Desiderata.—Betulae, Trepida, Diluta, Or and Myricae. Geo. Nicholson, 24, Nun's Moor Crescent, Newcastle-on-Tyne.

Duplicates.—A large number of species of European and Palaearctic Rhopalocera

and Heterocera. Desiderata.—All British species especially those illustrating characteristics of an island fauna. Dr. Lor. Kolb, München 54, Dachauer-str. 409, Germany, and Franz Daniel, München, Bayer-str. 77, Germany.

MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7.

8 p.m. March 2nd, 16th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. February 25th, March 10th, 24th.—Hon. Secretary, Stanley Edwards, Avenue Homse,

The Avenue, Blackheath, S.E.3.

The London Natural History Society.—Meetings first four Tuesdays in the month at 6.30 p.m. at the London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, W.C.1. Visitors admitted by ticket which may be obtained through Members, or from the Hon. Sec. A. B. Hornblower, 91, Queen's Road, Buckhurst Hill, Essex.

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CONTENTS

"Catalogue des Insectes Coléoptères de la Forêt de Fontainebleau," H	.D.	3 3
Review of E. Rivenhall Goff's paper on Tabanidae, J. E. Collin, F.E.S.	.,	37
Nomenclature, Hy.J.T		40
Cornish Notes for 1931, C. Nicholson		41
Collecting Lepidoptera in 1931, H. B. D. Kettlewell		43
A new form of Boarmia rhomboidaria, H. B. Williams, LL.D., F.E.S.		46
CURRENT NOTES	• •	47
Reviews	• •	51
SUPPLEMENT British Noctuae, H. J. Turner, F. E.S., F.R.H.S.	(217)-(29)	20)

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"Catalogue des Insectes Coléoptères de la Forêt de Fontainebleau avec indication des espèces nuisibles aux arbres." Colonel F. Gruardet.

Assn. Nat. Vallée du Loing. Moret-sur-Loing. 1930. pp. 1-227.

This very interesting work dealing with the Coleopterous Fauna of the Forest of Fontainebleau is much more than a mere list and, as will be seen later, it also gives a variety of other valuable information.

One may conveniently quote here from a letter written to me by my friend Colonel J. Sainte Claire Deville (a friend of Colonel

Gruardet) some years ago :-

"We have in the vicinity of Paris two old, well preserved, forests with 'réserves artistiques,' the forêt de Fontainebleau and the forêt de Compiégne. It is very striking that the fauna of the ancient British woods is much more analogous with that of Fontainebleau. The Compiégne forest, which was an extreme patch of the primitive 'Arduena silva' of Julius Caesar, has retained many elements of Eastern origin, which do not occur in Fontainebleau. The relicta of our semi-primitive woods on both sides of the Channel, are gradually vanishing, and it is high time that a good list should be published of them." 9.xi.26.

In this review I propose to compare the Coleoptera of Windsor Forest (of which I have the materials to hand, right up to date, ready

for publication) with that of Fontainebleau.

In the preface the author points out how the fauna is inclined to change more or less rapidly by the disappearance of very old trees; the effect of forest fires; the changes in the flora and vegetation: the replacing of oaks, etc. with other trees, especially pines; etc., etc.

He explains that the work is based on the numerous insects which he captured in the forest and town during two sojourns at Fontaine-bleau, from the end of December 1900 to April 1909, and October 1911 to December 1912. It is evident from two supplementary lists to the Catalogue that he has collected in this district from time to time since those dates. He has also obtained further information from the works, and collecting, of L. Bedel, J. Sainte-Claire Deville, H. du Buysson, Max Bernhauer, A. Dubois, F. Duchaine, etc.; and from captures recorded in the Annales et le Bulletin de la Société entomologique de France.

He justly points out that to make a work of this sort as

complete as possible one must:

1. Live in the region for a number of years, 15 to 20, on account of the variations in the number of individuals of the same species from one year to another, and more generally during a period of many years.

2. Be able to give up one's whole time to entomology. It is also necessary not to neglect the commonest species. The number of species listed in the main body of the catalogue is 2558 of which a large number appear to be very rare, but with a printed supplementary list of 89, dated December 15th, 1930, and a manuscript list of 67, dated September 30th, 1931, the grand total is 2714. The order and the names used are those of Reitter's catalogue dated 1906.

All his own captures are indicated by the number of the month or months of capture being given immediately after the name of the species,

and the circumstances of the capture.

The species harmful to trees are signified in a special manner, and

are classed in two grand categories.

1st Category.—Insects which attack healthy trees in full vigour, and in consequence are especially harmful. Their species are not numerous, and belong especially to the families *Cerambycidae*, *Curculionidae*, and *Ipidae*. These species are preceded by two asterisks (**).

2nd Category.—Insects which either attack unhealthy trees in the parts where the sap no longer circulates, or quite dead trees, either blown down by the wind, or cut down by the foresters. Their species are a little more numerous than those of the first category. Most of them attack trees which still retain their sap, the state in which one finds trees recently cut down. Their larvae then live either under the bark, or in the thickness of the same, or in the interior of the tree. A certain number only attack quite dry trees, in the interior of which their larvae excavate their galleries. In reality all these species are not really harmful except that they depreciate the marketable value of the trees by boring their galleries in the inner part of them. They do not cause damage to healthy trees. Nearly all of them have almost disappeared from forests which are regularly exploited, or are very rare there. Most of those which attack dry trees are found again in timber yards or houses.

Those species of which the larvae penetrate to the interior of the tree either during their life, or to construct their cells, are marked

with a single asterisk (*).

Those species of which the larvae live between the bark and the wood, or in the interior of the bark itself, but do not penetrate into the wood itself are marked with a broad stop (•). These species are not harmful properly speaking because they do not depreciate the marketable value of the tree. Nevertheless their workings render easy the introduction of damp under the bark, thus permitting the development of fungi, and by this means the rapid decomposition of the wood. He places in this last group a certain number of species of which the larvae live in the little branches, and slender dead twigs, of different trees, as well as the greater part of those which attack the leaves of healthy trees, and of which the damage is almost nil.

The greater part of the species of which the larvae live under the bark or in the interior of trees recently dead multiply in an extraordinary manner as a consequence of forest fires. This is particularly remark-

able with those which belong the family Ipidae.

There is occasion to remark that the insects of the first category never attack dead trees, and those of the second category always respect healthy and vigorous trees. The only exception is for certain species in the family Ipidae, which having multiplied in an extraordinary manner on account of forest fires as has already been pointed out, become harmful to healthy trees on account of the great invasion of these insects.

He marks species observed by himself with—CC=very common; C=common; AC=fairly common: R=rare: and RR=very rare.

Two lists also are given at the end of the Catalogue—the one refers to species that have been recorded in error, or whose existence in the forest requires verification; the other to species recorded in the Annales de la Société Entomologique de France (Bulletins), of which the

identity requires to be verified.

I now propose to compare the Coleopterous fauna of Windsor Forest with that of the Forest of Fontainbleau. The number of species listed by me for the former locality was on December 31st, 1931,—1602 (on December 31st, 1922, the then known list was—147) a considerably lower figure than that of the latter, but it must be remembered that beetles in France are vastly more numerous in species than in England. Also very local species, or those confined to a single locality in England are widely distributed in France—one may mention such very local British beetles as Cicindela germanica, L., Oberea oculata, L., and Chrysomela cerealis, L., which all occur at Fontainebleau, and there are many others such. Some 1035 species occur in, or have been recorded from, both localities. It will thus be seen that nearly 600 species found at Windsor have not yet been recorded for Fontainebleau, though nearly all the Windsor specialities occur there.

A certain number of species have been recorded for both localities which do not occur now, or at any rate have not been refound at Windsor. The following is a list of such species:—Teretrius picipes, F., Tillus unifasciatus, F., Triplax rufipes, F. †, Hyperaspis reppensis, Hbst., Adelocera quercea, Hbst. †, Selatosomus cruciatus, L. †, Melanotus punctolineatus, Pel., Elater cinnabarinus, Esch., Phaeuops cyaena, F. †, Ptinus lichenum, Marsh., Caenocara bovistae, Hoff., Scraptia dubia, Ol., Marolia variegata, Bosc. †, Spondylis buprestoides, L. †, Leptura revestita, L., Donacia dentata, Hoff., Chrysomela limbata, F. †, C. lurida, L. †, Gymnetron rostellum, Hbst., Aphodius 4-maculatus, L.

Those species marked with a dagger (†) are no longer included in the British list; nevertheless it is very probable that some of them at least were to be found formerly in Windsor Forest. To take two

examples:-

Selatosomus cruciatus, L. Stephens [Mand. 3 267 (1830)] records that it was taken near Windsor by the late W. Griesbach, Esq., of whose capturing four or five examples are in the British Museum. There are five specimens (no doubt those referred to by Stephens) in the drawer of doubtful British species in the British collection of Coleoptera in the British Museum.

Spondylis buprestoides, F. Stephens [Mand. 4 226 (1831)] records that it was taken in Windsor Forest in August, 1831 by the Rev. F. W. Hope. There are two specimens in the Hope-Westwood British Collection of Coleoptera in the Oxford University Museum. One is labelled "Coll. Hope," and the other "Windsor Forest, F.W.H."

The following is a list of the Windsor specialities which also occur

at Fontainebleau:-

Euryusa optabilis, Heer, E. sinuata, Er. §, Tachyusida gracilis, Er. §, Bolitochara reyi, Shp. §, Euplectus nitidus, Fair. §, E. afer, Reitt., v. infirmus, Raffr. §, Batrisodes delaportei, Aubé. §, B. adnexus, Hampe. §, Gnathoncus buyssoni, Auz. §, Abraeus granulum, Er., Rhizophagus oblongicollis, Blatch, Teredus cylindricus, Ol., Cis coluber, Ab., Ludius ferrugineus, L., Megapenthes lugens, Redt., Procraerus tibialis, Lac., Elater nigerrimus, Lac., §, Ischnodes sanguinicoliis, Pz., Eucnemis capucina, Ahr., Agrilus sinuatus, Ol., Lymexylon navale, L., Dorcatoma dresdensis, Hbst., D. serra, Pz., Dryophthorus corticalis, Pk. §, Rhyncolus truncorum, Germ.

Those species marked with a section (§) have only been found in Windsor Forest in Britain.

It is very remarkable that *Gnorimus variabilis*, L., which occurs rather freely in suitable old oaks in Windsor Forest, should not be recorded from the Forest of Fontainebleau.

It may be as well to mention the species which are attracted to burnt areas after forest fires, though not all of them have been recorded from both localities.

WINDSOR.

Pterostichus angustatus, Duft.
Agonum 4-punctatum, De G.
Micropeplus tesserula, Curt.

1 Cryptophagus ruficornis, Steph.
2 Melanophila acuminata, De G.
Ernobius mollis, I.
E. mulsantianus, Sharp.
E. oblitus, Sharp.
Cricephalus poloricus, Mots.
Salpingus ater, Pk.
Pityophthorus ramulorum, Perr.
(pubescens, Marsh.)

Pityogeres bidentatus, Hbst.

Fontainebleau.

Pterostichus angustatus, Duft. Agonum 4-punctatum, De G.

Melanophila acuminata, De G. Ernobius mollis, L.

Cricephalus poloricus, Mots.

Pityogene bidentatus, Hbst.

Pityophthorus ramulorum, Perr.

Of course many other species appear to be attracted to, or to become more abundant in burnt areas, but those of the above list are usually present

Our final list consists of those species which are found in both localities and which Gruardet has marked as being harmful. The

signs are used which he employed to classify such species:-

*Melasis buprestoides, L., **Agriotes lineatus, L., *Lyctus linearis, Gvez. (canaliculatus, F.), *Xestobium rufovillosum, De G. (tessellatum, F.), • Enorbius mollis, L., *Anobium striatum, Ol. (domesticum, Fourc.), *Ptilinus pectinicornis, L., *Prionus coriarius, L., *Leptura scutellata, F., *Criocephalus polonicus, Mots., *Asemum striatum, L., *Tetropium fuscum, F., *Phymatodes testaceus, L. (Callidium variabile, L.), P. alni, L., *Liopus nebulosus, L., **Saperda populnea, L., **Melasoma populi, L.,

Phyllobius pyri, L., Polydrusus cervinus, L., **Strophosomus melanogrammus, Forst. (coryli, F.), S. capitatus, De G., **Hylobius abietis, L., **Pissodes notatus, F., • Orchestes quercus, L., **O. fagi. L., • Rhynchites betulae, L., • Attelabus nitens, Scop. (curculionoides, L., **Eccoptogaster scolytus, F. (Scolytus destructor, Ol.), . E. intricatus, Ratz., • E. rugulosus, Ratz., • E. multistriatus, Marsh., **Hylesinus fraxini, Pz., **Myelophilus piniperda, L., **Hylastes ater, Pk., **H. attenuatus, Hbst., **H. opacus, Er., • H. palliatus, Gyll., • Cryphalus fagi, F., Pityogenes bidentatus, Hbst., **Ips laricis, F. (Tomicus laracis, F.), Dryocoetes villosus, F., *Xyleborus saxeseni, Ratz., *X. dryographus, Ratz., *X. dispar, F., *Platypus cylindrus, F., ** Melolontha melolontha,

L. (Melolontha vulgaris, F.).—H. Donisthorpe.

2 The "fire-beetle."

¹ In the Fungus Daldinia concentrica on young burnt birch trees.

A Review of Mr. E. Rivenhall Goffe's paper on Tabanidae (Trans. Ent. Soc. S. of England 1930.)

By J. E. COLLIN, F.E.S.

There can be no Collector of any Order of Insects who has not experienced during summer excursions unpleasant attentions from the blood-thirsty Tabanidae; few are interested beyond the immediate destruction of such pests, but my friend Goffe for the last two or three years has apparently never been really happy except when surrounded by swarms of these insects, and would travel many miles to any locality where Tabanidae were known to be particularly venemous in their attacks in order to secure specimens. The interesting and instructive pamphlet which he has published in the Transactions of the Entomological Society of Hampshire and the South of England is proof that his energies and self-sacrifice in the cause of Science has not been in vain.

About 70 pages are devoted to tables and short descriptions of all the British species while there are two plates illustrating details of some of the structural and other differences. Twenty seven species are listed as British while Verrall in Vol. V. of "British Flies" described only twenty five, but one of Verrall's species Tabanus glaucus was certainly partly described from the species correctly recorded by Goffe as T. miki, Brauer. The two additional species included by Goffe are Therioplectes borealis, Mg., and Atylotus plebejus, Fln. Th. borealis is reinstated as British on the strength of two specimens: -the male upon which Austen introduced the species as British in 1906 (British bloodsucking Flies), and a female without date or locality in the old Entomological Club Collection now in the Hope Department at Oxford. The male can quite definitely be ruled out as being only Th. montanus as indeed it was considered to be by Verrall. Austen working with Brauer's Monograph quite correctly ran this male down to borealis (Mg.) Brauer, but Villeneuve (Wien. Ent. Zeit. 1910) has proved from an examination of Brauer's specimens that the male of Brauer's borealis was montanus. With regard to the female, there must have been some "lapsus" on the part of Goffe. I have examined the specimen referred to and it is only an ordinary Th. bisignatus; Th. borealis therefore still remains to be discovered in this country and has no right to remain in Atylotus plebejus is recorded on the strength of two specimens in the British Museum taken by Mr. H. Womersley in Cheshire in 1911.

This paper of Goffe's is a remarkably good one when the fact that the author has only recently taken up the study of the Diptera is taken into consideration, but one feels that it could have been much improved if the author had delayed publication for another twelve months and spent the time in special investigations on a few of the more difficult species. There are also two outstanding faults, one being the acceptance without enquiry of the generic names* contained in Meigen's Nouvelle Classification of 1800 and the consequent use of Chrysozona in place of Haematopota; the other is the practice of giving names to "forms" of a species. These "forms" are all dealt with

^{*} For the present position in regard to the status of these names see the note by F. W. Edwards in the January number of Ent. Mo. Mag. and Entomologist.

under the heading "variation" and the author makes no distinction between a generally distributed variety or aberration such as those occurring in the genus Chrysops and restricted to one sex only (the female), and a possible local race such as his sudeticus meridionalis. No doubt it is hoped that an easy reference to different "forms" may lead to a better knowledge of their distribution and biological significance, but the value in this respect is no compensation for the immense burden placed upon nomenclature. One can only hope that the author's action will hasten the day when it will be universally accepted that such names are outside the pale of the "Law of priority" and can consequently be ignored by taxonomists. Apart from these faults the work is one which should not only stimulate present workers in this family but add to their numbers.

Those who intend to help in the study of this interesting family may be glad to note one or two observations and additions to Goffe's work which I am in a position to make, often largely due to the examination of material collected by Goffe himself, or to the re-examination of my own material in the light of that author's work with the

idea of confirming or confuting some of his conclusions.

Tabanus bovinus group.

The common New Forest large Tabanus has so long been considered to be bovinus that it comes as a shock to find that though true bovinus does occur in the Forest it appears to be a rare species. Goffe and Verrall both realized this in regard to the male, but both failed to distinguish correctly the female. In fact I am not certain that Goffe at present possesses a female while the great majority of Verrall's females were not bovinus. This is not the place to go into details of the characters distinguishing the true female of bovinus but one should on no account fail to catch and pin any of these larger New Forest Tabanids having green, or coppery-green, instead of coppery-brown, eyes. The more common New Forest large Tabanus will probably prove to be identical with sudeticus var. perplexus, Verrall, which I am convinced must rank as a species.

In trying to separate his "forms" of sudeticus ? Goffe places too much faith in small differences in the shape of the shining frontal callus, this is a character which is particularly liable to suffer from abrasion, an injury which may increase with the age of the specimen and is almost unavoidably inflicted to a greater or less extent when specimens are caught. One has only to compare Goffe's figure of the frontal callus of his supposed female bovinus with that of his perplexus, to see that the differences are only such as might easily be due to

abrasion.

Therioplectes tropicus, L.

There has been much confusion in the use of this name. Brauer, according to specimens sent to him by Verrall and returned as tropicus, certainly included at least two species under this name, for the "Worcester" specimen is quite distinct from all the others. Verrall noted the differences of this specimen but, though Brauer had returned it as typical tropicus, treated it as an extreme pale form of tropicus, and used the name tropicus for what I should call bisignatus; he

probably did this because Brauer had also returned some similar bisignatus forms as typical tropicus. Having used the name tropicus for this form, Verrall (perhaps influenced further by Brauer's statement that he considered bisignatus to be a melanochroitic form of tropicus) used the name bisignatus for the darkest form with "the reddish colouring sometimes quite absent" from female abdomen. Goffe naturally follows Verrall with the exception that he begins to be suspicious of the tropicus tropicus of Verrall and would place males which Verrall considered to belong to that form as males of bisignatus, and in doing so is probably correct. The few females which Goffe refers to tropicus tropicus are, like Verrall's, almost certainly only a form of bisignatus with the pale markings at sides of segments 1 and 2 more extensive.

True tropicus must be a species with the sides of the first three abdominal segments yellowish in the female, and if it occurs in this country is represented by the "Worcester" specimen mentioned above. An examination of the so-called form of tropicus mentioned by Verrall in the Addenda to British Flies, Vol. V., as taken by Col. Yerbury at Crymlyn Bog in 1908, reveals the fact that they are specifically identical with the Worcester specimen, and the same species also occurs in the Norfolk Broads district. The separation of this species (which I feel bound for the present to call tropicus) from bisignatus and the raising of T. perplexus to the rank of a species adds two additional species to the British List, making 28 in all.

Therioplectes solstitialis, Mg.

I feel certain that Goffe has mixed up two species under this name. I have not seen Andrews' Sutton Broad specimens but the species I have taken in the Norfolk Broads is the British tropicus (v. above) and quite distinct from the species occurring in Chippenham Fen, and at Lyndhurst and other parts of the New Forest, mentioned by Goffe, these latter being probably the true solstitialis of Meigen. My specimens of the Norfolk Broads species (tropicus) occurred early in August in company with distinguendus but were at the time easily recognised as distinct.

It may be gathered from the above remarks that there is still plenty of useful work to be done in collecting Tabanidae, while a study of Goffe's paper will show that there is an immense field of research awaiting those who will take up the study of variation, especially in such species as Tabanus sudeticus and perplexus and Therioplectes distinguendus and montanus.

No one, I am sure, will be more pleased than my friend E. Rivenhall Goffe if the publication of his paper gives the necessary impetus to the collecting and study of this interesting family—which includes some of the largest of the British Diptera—with the consequent clearing up of outstanding problems, and the acquisition of a sound knowledge of the species inhabiting these islands. He will, I know, willingly offer information and advice to anyone interested who cares to enter into correspondence with him, and I would conclude by asking all students of Diptera to give him every possible help.

Nomenclature.

We have been asked what is the justification for the very modern introduction of the generic name Lycaeides in place of the original generic name Plebeius of Linneus. We can find none except a matter of ignore-ance, i.e., ignoring the work of Linneus. The query has caused us to look up what Tutt and his band of skilled helpers said in British Lepidoptera. Tutt based his nomenclatorial conclusions upon every scrap of information and fact, for which he gave ample references.

Turning to the chapter on Tribe: Plebeiidi in British Lepidoptera Vol. X. = British Butterflies, Vol. III. p. 150 and seq. p. 160 (1908) we find every point dealt with. Of course one must bear in mind that the terms "family," "tribe," "genus," etc., used by Linneus and other early authors did not indicate the same degree of classification as in modern usage.

A modern writer has said that true facts cannot be repeated too often so that must be our excuse for reprinting here much of the fact and argument given in the above, merely stating that we have verified all the references except Kluk.

Ex Brit. Lep. p. 160. "Scudder announces and states (Hist. Sketch, pp. 93, 252, 1875) that Plebeius was not used by Linneus in a generic sense, and that he only used the name in the plural form."*

After giving (Sys. Nat. Xth ed. p. 482) the name Plebeii to the whole of the "hairstreaks," "blues," "coppers" and "skippers," and subdividing them into (1) Plebeii rurales (p. 482) and (2) Plebeii urbicolae (p. 484), Linneus prefaced his description of every species of these groups with the letters, "P.P." writing in full at the top of each page the names thus contracted "Papilio Plebejus." Each species therefore had the singular form applied thereto, e.g., "P.P. betulae," "P.P. argus," etc., so that Plebeius was here used quite in the modern generic sense of the division next above the species. Tutt then refers to Müller, Fn. Ins. Frid. p. 37, (1764), to Linné Sys. Nat. XIIth. ed., p. 787 (1767), where Plebeius was used in exactly the same sense. Tutt further says "Considering, as we do, that the basis of binomial nomenclature—species and genus—involves the necessity of treating the group directly above the species as a genus, we consider this use of Plebeius as essentially generic in the modern sense." cites (teste Prout) Kluk, Zwierzt. Hist. Nat. IV. p. 81 (1780) in which the author "After briefly describing the butterflies in general, says that they be grouped in five genera, the last of which is

Genus V, Plebeius divided into Rurales—Plebeius cupido, etc.

Urbicolae—Plebeius comma, etc.

which is exactly what Linné did in his Sys. Nat. Xth ed. pp. 483 et seq. where having divided Papilio into various divisions, of which the Plebeii are one, and after subdividing these into Rurales and Urbicolae, he calls each individual species in the Plebeii—"P.P." i.e. Papilio, Plebeius, the names being placed at the top of every page on which the Plebeid species are described."

This argument seems so convincing to us that we shall continue to use *Plebeius* for the *aegon*, *argyrogmon* group of Lycaenids.—Hy.J.T.

^{*}It is inexplicable how Scudder could make such a statement if he ever saw a copy of either the Xth or XIIth edition of the Systema Naturae.—H.J.T.

Cornish Notes for 1931. By CHARLES NICHOLSON.

Referring to my notes on Heliothis peltigera and some Cornish Sphingids on pp. 157-8 of last volume I should like to add that the three peltigera that emerged were of the brown form, No. 2 in Mr. Wightman's classification on p. 182, and there is some brown suffusion on all these specimens over the whole of the space between the subterminal line and the basal line, except the subcostal area between the basal line and the reniform stigma, and this area is the only ochreous part of the wing. The other pupae either dried up or otherwise died.

The season of 1931, although on the whole a wet one here, was by no means unproductive as regards numbers of lepidoptera, which were about up to the average, but I have no records of *Phryxus livornica* to set off against those of *Agrius convolvuli* last year and must be content

with Manduca atropos already noted.

Butterflies were about as usual with the exception of the following:-Colias croceus, one crossed the garden on September 8th, and one was seen on Perranporth Sandhills on August 30th. Gonepteryx rhamni was scarcer even than usual, only two males having been seen-one in the garden on September 15th, and one on red campion (its favourite flower about here) on October 11th. Aglais urticae was also even scarcer than usual, having been seen four times only, and three of hese (in garden August 6th, on Buddleia variabilis flowers in next garden August 31st: on road wall of next garden October 14th) may have been the same specimen; the other was on flowers of Escallonia illinita in Boscawen Park, Truro, on October 7th. Pyrameis cardui was fairly common and seen in most localities I visited—in garden June 3rd, Malpas (very wasted) August 2nd, common and fresh on thistles near Probus on August 23rd, in garden on Sedum spectabile, September 25th and on Michaelmas daisy (very sandy) October 11th, finally at Boscawen Park, October 18th. Lycaenopsis (Cyaniris) argiolus, very scarce; I have no dates and cannot remember having seen a single specimen, although we usually see examples of the first brood. Pararge aegeria was even commoner than usual and seemed to be everywhere in shady lanes and rides in woods. First seen in the garden on May 7th and then almost continuously until October 18th (Boscawen Park) including a good many on thistles, August 23rd, and two in the garden all day on Sedum spectabile, September 25th. One of my most interesting captures was Synanthedon (Sesia) vespiformis, of which I boxed a pair evidently just emerged—the male on an old oak stump in the garden on June 11th, and the female within two yards of it, but on an Escallonia bush on June 8th. No doubt both these had fed up in the old stump and as there are about a dozen other oak stumps in the garden I am surprised that I have not seen more of this clearwing. About the middle of May I found two-thirds grown larvae of Lasiocampa quercus f. callunae on Bolenowe Moor, near Redruth, and on bramble in the hedges around upland fields about here, and the moths emerged during the first half of August. I tried sembling in the garden with the fresh females, and males came on August 1st, 3rd, 5th, and 7th, but only one male on each day! I allowed several of them to pair and also some of my bred males, and got several hundred ova, which began to hatch on August 30th. I fed them up on hazel, sallow and other things until

they were about half an inch long and then I turned them out into the garden in suitable spots, except about 20 which are at present feeding on ivy in the garden shed and are about an inch and a quarter long. The moths, by the way, were very typical.

On Sept. 24th the forewings of Noctua c-nigrum left by the bats were found in the verandah and on Sept. 25th the right forewing of Chloroclysta siterata—the first time I have seen this species here.

Of other orders" the most interesting example of the Dipterataken was a female Sargus bipunctatus, which I saw settle on our hedge of Cupressus macrocarpa late in the afternoon of Sept. 25th. As it looked unfamiliar I netted it and was very pleased to see that it was unfamiliar. It is remarkable that Verrall never saw it alive, as he says in "British Flies," Vol. V. p. 170, although it seems to be widely

distributed in Great Britain, and has been taken in Ireland.

The outstanding species of the season, however, was one of the Coleoptera, to wit, Strangalia aurulenta, which was quite common in the garden here. It may be recalled that I recorded two captures of this species, bothfemales, in 1930, on a young Turkey Oak (July 5th) and a young Broom (July 22nd) respectively; see this magazine Vol. XLII. p. 155. The first capture last year was on July 1st, when I felt something alight on my head in the garden about 11 a.m. and, on putting up my hand quickly, found it was a male of this species flying in the bright sunshine. The next seen was a fine 2 on a young tree of Pyrus intermedia on July 10th; then the species was seen nearly every day up to the 27th, after which no more were seen at all. As the circumstances of capture are rather interesting I give the list in brief, omitting the times of capture, which were usually in the morning. The weather on mostdays bright, but cloudy at first, usually followed by more or less sunshine all day and occasionally with a shower or two; the state of the sky did not appear to make any difference to the beetles, but on every day on which they were seen the temperature was between 58° and 75°. These are the other records: July 13th, small male on granite boulder on rockery. July 15th, fine 2 on watercan in garden shed. male on doorstep of shed. July 17th, male on a flower stake in garden. July 19th, male in shed with right posterior tarsus missing. July 21st, another male on the rockery; flew away before I could box it. July 22nd, female with damaged elytra tips, in shed. July 23rd, male on American currant in garden. July 24th, a fine female buzzing on the window of the shed fell down and was seized by a spider and carried into its tunnel; another fine ? was found in a bush of Cistus salvifolius and a male and a female were found on oak branches in shed, the male having a hole in the "shoulder" of his right elytron; these were boxed in a large glass bottomed box and promptly paired. July 25th, malewith right posterior leg missing, in shed. July 27th, male and female in cop. on ground in front of shed.

It will be noticed that ten of these specimens were found in or about the garden shed, and as there were a number of oak branches (for firewood) varying between $2\frac{1}{2}$ and 5 inches in diameter, and between 3 and 10 feet in length I was led to the opinion that the beetles had emerged from these branches; as we have 3 large oaks and a number of old stumps in the front garden (in which all the other specimenswere seen) it seems practically certain that they were the sources from which the other specimens came. We have no pines of any size in the

garden, so the idea I had previously been led to hold, that this species was attached to conifers, is evidently erroneous. We have no birch in the garden either except a young tree I myself planted, so Mr. Donisthorpe's note in this magazine, Vol. XLI. p. 125 will not apply. It is curious that, with the exception of the one taken on July 1st and the one that flew away on the 21st, I saw none on the wing in the open, although I have seen Toxotus meridianus flying in the sunshine in some numbers in Epping Forest near Chingford, and there oaks were almost the only trees.

It seems therefore from these records that July is the month for this species, but although Fowler says: "On flowers" I cannot corroborate this, for not a single specimen of those seen was on any sort of flower and only five of them were on living plants at all. The only other specimen I have was taken near Bovey Tracey in July 1924, when it flew down from some pines into an adjoining clover field and its unusual appearance aroused my curiosity. Dr. R. C. L. Perkins has had some experience with this species in that locality and I hope he

will give us the benefit of it.

It may be well to call attention to an interesting point about the copulation of this insect. As a rule both sexes of all species of insect that I have observed are quiescent, if undisturbed, during this process, but in the case of this species the male in each case showed a slow but rhythmic pulsation (rather suggestive of pumping), which seemed to "flow" from his head backwards, causing a slight movement of the whole beetle, including the milk-white aedaeagus, at least two-thirds of which was visible. Has anything of this kind been observed in other insects?

Collecting Lepidoptera in 1931.

By H. B. D. KETTLEWELL.

Spring Collecting in Scotland and the North.

For the first time this spring I had the pleasure of doing what all my older collecting friends have done many times in the past—namely of visiting Scotland in early April, and although the results of their various expeditions have more than once been written in the pages of this journal, I do not hesitate to repeat my own experiences of such pleasant and varied collecting.

I was accompanied by my mother who was a most active helper throughout the trip. We reached Scotland on April 9th and the following day leaving Stirling and travelling via the Sma Glen we passed through Aberfeldy and so on to Struan where we halted for

about on hour.

We found Nyssia lapponaria fairly common but extremely local, being confined to a couple of hundred yards—both sexes in equal numbers were sitting about on posts. Several pairs were in copula. Polyploca flavicornis was very abundant on these same posts.

We reached Aviemore about an hour later and in the failing light

of the day I found one worn specimen of Asteroscopus nubeculosa.

After dark large numbers of insects came to the sap, which was running freely from recently cut birch trees.

Orrhodia vaccinii, Calocampa exoleta and C. vetusta were extremely

common together with magnificent forms of Taeniocampa incerta and T. gothica var. gothicina. We spent the following days tree-searching by day and examining birch sap at night and aided by Mr. Brookbanks of Aberfeldy, who joined us, we took the following species:—

P. Havicornis.—Was common on some days on all posts and tree trunks and then was absent on others. It flies freely to birch sap in early afternoon particularly if the sun is shining. Some beautiful

banded forms were taken.

A. nubeculosa.—16 were taken in all. 1 on the 10th, 3 on the 11th, 2 on the 12th, 4 on the 13th, 5 on the 14th, 1 on the 15th and none on the 16th or 17th. They sit on any side of a birch trunk from two to 15 feet from the ground—usually about 6 feet. Occasionally they are very difficult to see. We took a few on birch sap at night.

Eggs were laid freely by a 2 in confinement on the muslin covering a cardboard box. At first the ova are an orange red colour, but they soon became dark. I gave Mr. Lees of Streetly the greater number and kept a dozen myself. He succeeded in getting nearly a hundred fullfed larvae, sleeving some and keeping others in breeding cages. Due to the enormous depth to which these larvae bury themselves he lost the larger part of the brood through their entering the ashes on which the eight or nine inches of peat stood.

Mine were fullfed by June 26th and throve in the middle of

London provided the birch was sprayed every evening.

E. versicolor.—I was surprised to see this beautiful creature out as early as the 12th up here—the males dashing about in the few brief moments of sunshine. It was here that Mr. Esson several years ago assembled so many males around a cardboard box containing a female that the box was knocked off the post on which it stood! My own observations and method of catching were different,—I only saw four males on the wing and three I obtained in perfect condition by giving them a smart rap with a six foot birch bough!—in each case after a very active two hundred yards or so, which made me appreciate the quieter modes of collecting such as pupa digging or even 'assembling.' I saw one or two males on wet days sitting conspicuous on the birch trunks. I found them better sport when on the wing!

T. gothica.—Was very abundant on birch sap. About 40% were

var. gothicina. Some very extreme forms were obtained.

T. incerta.—Was not very abundant at Aviemore. Some beautiful

grey mottled forms were obtained.

Pachnobia rubricosa.—Only one example of this species was seen at Aviemore. It came to birch sap and was the most extreme ablucida, I have ever seen.

Orrhodia vaccinii.—Common on sap. Scopelosoma satellitia.—A few on sap.

C. exoleta.—Very common on birch sap. One pair in cop: on the 16th ova obtained.

Brephos parthenias.—Very common in the sunshine. Visited birch sap by day but was even then alert. Ova not obtained.

Chloroclysta miata.—One on birch trunk.

Calostigia multistrigaria.—Very common after dark.

Nothopteryx carpinata.—Fairly common. Some beautiful forms of ab. fasciata taken; ova obtained.

Lycia hirtaria.—2 on the 12th, 2 on 14th. One fine yellow female.

Males of pale and bright yellow obtained. A very large number of ova were laid. I attempted to get the crossing hirtaria ? with lapponaria 3, which I obtained so easily four or five years ago when the resulting ova proved infertile, but was entirely unsuccessful. I hope to try it

again this spring.

Nyssia lapponaria.—At Struan. 9 on the 10th, 7 on the 12th (very cold). On the 18th I noted a 2 busily engaged in ovipositing in the afternoon sunshine. She had her ovipositor fully \frac{1}{2} inch extended into the crack of an old post in the depths of which I could see a large green batch of eggs. They laid very freely in captivity both in muslin balls and fluted paper. Mr. Lees kindly bred me them. The larvae

fed up very slowly throughout the summer.

On the 17th of April we left Aviemore and went to Rannoch, where I met Messrs. Pennington and Poore. I learnt from them that the local A, nubeculosa had not appeared in the Rannoch district for some years, and in vain did I search its well known haunts of Finnart and Cairie Wood. I was very disappointed about this as I hoped to be able to point out what I have never seen noted before, namely the local difference between the Rannoch and Aviemore "sprawlers." All those I have seen from Rannoch have a distinct purplish brown tint—this never is seen from the Aviemore locality where a plain grey ground colour is the usual form.

Sallow at Rannoch produced large numbers of P. rubricosa, most of which were referrable to the form lucida. I also took a nearly white Taeniocampa munda (ova obtained). At sugar we took the Taeniocampidae in moderate numbers and some magnificent forms of var. gothicina turned up. I was surprised to note a fine 3 T. populeti on sugar. N. carpinata and vars. came commonly to light and was plentiful on the tree trunks. One female Ectropis bistortata was observed on a birch tree.

In vain did I search the bilberry for early larvae but not one was taken.

Thanks to the kindness of Mr. Pennington, I was put on the track of two insects I had never before taken in numbers, namely Pachnobia leucographa and Nothopteryx polycommata, and was advised to try for them near Grange Over Sands on my return journey.

On the 26th we spent the night at Keswick. I searched the birch trunks in vain for newly hatched Lophopteryx carmelita without

success.

The following night we arrived at Grange and were taken out to a wood in the vicinity by Miss Reid and Miss Molyneux to whom I owed all my success. They called it a "poor night" nevertheless we took 19 fine P. leucographa together with fewer numbers of Taeniocampidae on the sallows. I was sorry not to take T. miniosa, which they had been taking. N. polycommata was exceedingly abundant sitting motionless on ash twigs and a fine series were taken. about ten males to one female. I was fortunate in taking one absolutely black Eupithecia abbreviata and understand that this melanic form is not at all unusual in this particular wood.

The following day (April 23rd) I had the pleasure of meeting Dr. Lowther and seeing his wonderful local collection, and in the evening we met at the same locality as on the previous night. P. leucographa was again fairly abundant. The 2s lay freely on muslin balls and

Mr. Lees has bred me a large number of larvae.

On the 24th we returned home and were thus away just a fortnight and during that time took the surprising list of 25 different species and this list not including many of the common spring Geometers which were not sought after.

I can recommend this spring trip for this "Year of Economy" to any of my Entomological friends who normally spend their April in possibly warmer climes but with certainly less invigorating collecting.

A new form of Boarmia rhomboidaria.

By H. B. WILLIAMS, LL.D., F.E.S.

As shown in my paper read before the South London Entomological Society on March 10th inst. I think I have established that my "yellow," so distinct in facies, has a genetic constitution distinct from "grey" rhomboidaria—at least as distinct, it may be precisely as distinct, as the violet grey perfumaria. I think then that it should now be described. Where in the scale of organisms inferior to a species it should be placed, I do not know. Turner calls perfumaria a "race." It is an odd one, to say the least. It may be an assemblage of races. I am content to call my form an aberration, and as a slight tribute to my friend and helper Mr. J. C. Haggart of Glasgow, who introduced it to my knowledge, I wish it to bear his name.

Boarmia rhomboidaria ab. haggarti ab. nov.

Head, thorax, patagia, abdomen and wings of a smooth pale yellowish grey, the bands on the abdomen only faintly suggested. The smooth appearance of the wings, a conspicuous feature in both sexes, is due to the almost entire absence of the freckling of black dots, which gives a rougher and darker appearance to rhomboidaria. In fact the yellowish grey ground colour of the wings, in spite of the pale appearance of the insect, is not paler than the whitish grey of typical rhomboidaria, the dark grey appearance of which is due to freckling, which is also a prominent feature in the bright ochreous aberration australaria, Curt.

On the pale ground, the usual markings are indicated, but in a paler shade than in other forms; the cross lines on the fore-wings quite weakly marked, the discoidal spot, on the other hand, being very distinct and prominent and accentuated by a clear pale area below it; the subterminal line distinct, and the apical and subapical markings clear and conspicuous.

The hind wings particularly smooth, but the markings are indicated. The second cross line tends to be weak and is obsolescent in one ?

specimen.

Size of B. rhomboidaria.

Types. 3 and 2 in coll. mihi. 3 bred 19.vii.1928. 2 bred 29.vi.30.

Co-types 3 3 3 3 2 in coll. mihi. 2 other 2 2 in coll. mihi. 1 2 in coll. Dr. E. A. Cockayne.

Other specimens in coll. J. C. Haggart.

Habitat. Largs, Ayrshire.

This aberration only occurs, so far as is at present known, at Largs, on the Ayrshire coast. The only specimens found at rest have been on walls to which their colour assimilated well.

CURRENT NOTES AND SHORT NOTICES.

Many local lists of the Lepidoptera have appeared in this country from time to time, but few have included the so-called Micro-lepidoptera. All are for the most part mere lists including the names of a few general collecting spots, but none show even an attempt to combine such excellent biological facts and suggestive details of the life-history of the micros as does the book before us. The Moths of Eastbourne, Pt. II. The Pyralidina to the Micropterygina with the Obtectae, the Burnets, Clearwings, Swifts, etc. This third section of Mr. Robert Adkin's work, the most difficult portion, really outdoes the two excellent parts previously published. One would have said that it was impossible to condense so much information into the few sentences alloted to each species native to Eastbourne. When one turns to the plates, 25 in number one, is envious of the young nature lover whose privilege it will be to start studying the smaller fry of the district with this excellent guide in his possession. Even the older entomologist may study this volume with great advantage to himself with the suggestive details here given. Nothing is omitted that is of paramount importance, from the most effectual method of killing to the provision of an excellent map. We must congratulate the author on this most useful piece of work, and the Eastbourne Nat. Hist. Society, under whose auspices it has been published as a Supplement to their Transactions.

The Ministry of Agriculture and Fisheries have sent us a series of 14 "Advisory Leaflets" and Bulletin 29 on "Insect Pests and Fungus Diseases of Basket Willows." The latter is well-illustrated showing the pests themselves and views of their depredations. Among the pests are: Lepidoptera:—Trochilium bembeciforme, Synanthedon formicaeformis, Depressaria conterminella, and Hypermecia cruciana. Coleoptera.—Aromia moschata, Galerucella lineola, Phyllodecta vulgatissima, and Cryptorrhynchus lapathi. Diptera, the midge Rhabdophaga heterobia. These are figured on the plates, but other species are referred to in the text. The leaflets are re-issues of older leaflets brought up to date with modern illustrations and additional information. They are

quite adequately illustrated.

The Int. Ent. Zeit. for Oct. 8th describes and figures a remarkable aberration of Zygaena transalpina in which the spots of the forewing are wanting except the lower spot of the outer marginal pair. Spots 3, 4 and 5 are completely absent, but of 1 and 2 there are obsolescent traces. The captor O. Michalk has named it ab. paradoxa. It was taken in Bayaria.

To those who are interested in the naming of the lower grades of species of the Lepidoptera, one would wish to call their attention to an article in the *Ent. News* for October. The writer would place the naming of such on a biological basis and exclude most racial and aberration names. He would recognise the great regional subspecies but the naming of lower grades would be an exceptional occurrence.

To those Lepidopterists who visit Berne one would suggest a visit to the "Alpinen Museum" to view the collection of alpine butterflies under the care of the Entomological Society of Berne. There are six sections. 1. Alpine species not found in the high north. 2. Alpine species also occurring in the high north. 3 and 4. Species of the lowland and the alpine slopes up to 4000 ft. 5. Lowland species and

corresponding forms of the Alps, which are attached to the same special alpine plants. 6. Species of the warmer zone and southern

alpine valleys. Many examples of melanism are included.

Our trusted correspondent Capt. K. J. Hayward has sent us separates of three articles he has contributed to the Revista Soc. Ent. Argentina.

1. Instruction, with 2 diagrammatic plates for detailed descriptions of ova, larvae and pupae of a Lepidopteron.

2. Notes on a migration of the Argentine subspecies automate of Pieris phileta (monuste).

3. Abnormalities of four insects he has recently met, with figures of the deformities.

A large quarto volume of 320 pages and 35 plates some coloured has reached our table from Sao Paulo, Brazil. Archivos do Instituto Biologico, vol. IV. 1931 contains 18 articles on natural history of which four deal with entomology Diptera, Coleoptera and Ants. The main body of the volume is in Spanish but every article has a long abstract of its contents in English and also several abstracts in German. The volume is very well got up and records admirable work done on the Fauna and Flora of S. America by competent experimenters.

We regret to note that several well-known continental entomologists have died recently including M. J. Culot of Geneva, who was the artist of those beautiful volumes on the *Noctuelles et Geometres*; P. J. S. Tavares, who was the editor of *Broteria* and devoted to the Cécidiês; M. J. P. Dognin, the great Belgian student of S. American Heterocera; and Dr. F. Rambousck of Prague well-known for his knowledge of the

Staphylinidae.

A separate from the Ind. Jr. of Veterinary Sci. and Animal Husbandry illustrating and describing 24 species of Tabanid Diptera has been received from the authors, T. Bainbrigge Fletcher and S. K. Sen. The figures being in colour and of natural size must be of great practical use and the correctness of the matter must be inferred from the prestige of the authors.

L'Amateur de Pap. continues the descriptions of good French localities for Lepidoptera. In the November no. we have an account of Euzet-Les-Bains (Gard) by M. le Comte A. d'Aldin. The article includes a list of species indigenous to the neighbourhood. The same number contains a further portion of "Collecting in Madagascar."

There are two excellent black and white plates of albinistic and melanistic forms of Melanargia galathea in the December no. of Zeit. Oster. Ent. Ver. with descriptive letterpress by Hans Hautz. A fine gynandromorph from the Höfer collection in Wien is given. There is

a summary of the different named forms.

Hunting Insects in the South Seas. By Evelyn Cheesman. Philip Allan.—The authoress is rapidly becoming as good a writer as she is a good collector and observer of insect habits and transformations. She experiences unknown dangers often alone in the bush, even spending nights alone in deserted huts at the full mercy of native attacks; hitherto she has emerged unscathed. In fact at times, as she told us one evening in a lecture to the South London Entomological Society she was "taboo" and every native feared to cause her harm in any way. In the present work are such subjects as Potter wasps, Friendly Butterflies, Caterpillars, Fireflies, Bees, Praying Mantises, A night in the Bush, and A Climbing Adventure on the Marquesas Islands. This is not a record of mere fact, but a search for the reason and object of

all the curious habits of the creatures dealt with. Obviously the cocoon is an arrangement gradually evolved for protection of the pupa during its quiescent stage, when it would be exposed to attack without ability of defence. But there is a second "significance to the cocoon." "Why some caterpillars wrap themselves up so carefully in bales of silk before yielding to those delicate operations by which they are changed into the mature form is because they avoid risk of a shock by doing so." There are a few illustrations but one would like more and particularly one wants a map. The book is in a very attractive jacket illustrating one of the strangely fashioned insects encountered. Those who have heard Miss Cheesman lecture will need no further inducement to peruse this volume, and those who have perused the book will wish for a closer acquaintance with her in her lectures.

In Lamb. for October M. Derenne gives a summary of the views of different writers on the naming of varieties, which is well worth careful reading and thought.

The Entomological Society of London have recently added two eminent foreign entomologists to the much coveted honorary fellowship of the Society, viz., Dr. Walther Horn of Berlin (Germany) and Monsieur René Oberthür of Rennes (France).

The following has been sent to us; an excerpt from a Daily Newspaper. It looks as if the writer was endeavouring to measure the depth of utter rubbish which the editor would insert.—"A curious beetle. Imprint of fly on its back. To the Editor of the Morning Post. Sir,—I am no ornithologist, but to-day (Friday), on a mountain-side in the Eifel, I saw a beetle which was quite new to me. He was wholly of a vivid scarlet, except his proboscis, which was black. At the end of each of his antennae was a good imitation of a penknife, which opened and shut like one, and, when open, gleamed like steel. On the perfectly flat back of this wholly scarlet beetle was the perfect impress, in black, of a fly. From time to time my friend would stop working his knife, and, with a hind leg, lazily polish the impress of the fly, by which the wings of the fly gained an additional shimmer." Wandervogel, Altenahr."

We have just received the prospectus of the 5th International Congress of Entomology to be held in Paris this summer from July 16th to 23rd. The Meeting of the Congress will coincide with the celebration of the Centenary of the Entomological Society of France. Arrangements have been made for the occasion. Dr. P. Marchal will be President of the Congress, Dr. K. Jordan of Tring is the permanent Secretary, Dr. H. Eltringham represents Gt. Britain on the Executive Committee, Dr. R. Jeannel France, Dr. Walther Horn, Germany, Dr. Y. Sjosteat Sweden, and Dr. O. A. Johannsen the United States. We trust there will be a move in Nomenclature and that the Entomologists will strike away from the domination of the Zoologists. Those who wish to take part in the Congress should write to the General Secretary, Dr. R. Jeannel, Laboratoire d'Entomologie, Muséum National d'Histoire Naturelle, 45bis, Rue de Buffon, Paris (5e), France.

On page 126 of last year, July-August 1931, we called attention to the immigrant lepidoptera of which we had heard in this country during the season. Any further records or a summary of what readers have noted along the coast, or far inland would be most acceptable. This individual observations we want, which when pieced together may give dates of arrival on the coast, dates of appearance in the inland south, dates in the centre of the country, dates farther north, and so on, besides indicating second immigration if occurring. The portents of the present season seems so far to point to further abnormal weather, when no doubt further mass movements of insect species will occur. The method of recording was well described by Dr. C. B. Williams in a Supplement to our journal in November last and we can supply prepared cards to all who ask for them.

The Annual Gathering of British Entomologists, The Verrall Supper, took place on January 19th and was again a very successful gathering of old friends from far and near with a fair sprinkling of new and younger men. There were not quite so many present as there has been for the past few years and a few of the old members were missing. Appended is a list of those present: -B. W. Adkin, J. H. Adkin, R. Adkin, H. E. Andrewes, H. W. Andrews, Dr. R. Armstrong, E. B. Ashby, S. R. Ashby, Maj. E. E. Austen, R. S. Bagnall, F. Balfour-Browne, H. F. Barnes, Sir T. Hudson Beare, E. J. Bedford, E. C. Bedwell, R. B. Benson, G. T. Bethune-Baker, K. G. Blair, S. F. P. Blyth, E. D. Bostock, H. Britten, Dr. G. V. Bull, Dr. M. Burr, L. C. Bushby, Prof. Bailey Butler, Dr. P. A. Buxton, Dr. M. Cameron, Dr. Hale Carpenter, S. G. Castle-Russell, Dr. E. A. Cockayne, C. L. Collenette, J. É. Collin, J. Collins, L. G. Cox, L. W. R. Cox, E. S. Craske, W. Parkinson Curtis, H. W. Daltry, R. P. Demuth, J. R. Dibb, Dr. F. A. Dixey, A. W. Dods, H. Donisthorpe, S. P. Duffield, H. M. Edelsten, J. H. Edmonds, F. W. Edwards, H. Willoughby-Ellis, Dr. H. Eltringham, W. Fassnidge, R. A. Fisher, L. T. Ford, G. Fox-Wilson, F. W. Frohawk, J. C. F. Fryer, A. G. Gabriel, A. F. J. Gedye, W. S. Gilles, F. J. Gilliat, E. Rivenhall Goffe, A. de B. Goodman, E. J. Griffen, T. H. L. Grosvenor, H. M. Hallett, A. R. Hamm, H. S. Hanson, C. N. Hawkins, A. R. Hayward, Dr. L. G. Higgins, W. D. Hincks, B. M. Hobby, A. W. Hughes, Prof. S. Issiki, Dr. K. Jordan, Dr. Norman Joy, H. B. D. Kettlewell, Dr. H. Lancaster, F. Laing, H. A. Leeds, H. G. Leeson, G. C. Leman, J. Spedan Lewis, H. Main, W. Mansbridge, A. M. Massee, Prof. S. Maulik, W. T. Mellows, Rev. J. W. Metcalfe, Dr. S. A. Neave, L. Nell, L. W. Newman, L. H. Newman, M. Niblett, F. A. Oldaker, H. E. Page, T. Parker, J. F. Perkins, F. N. Pierce, S. W. P. Pooles, Prof. E. B. Poulton, R. M. Prideaux, L. B. Prout, Capt. E. B. Purefoy, W. Rait-Smith, O. W. Richards, Capt. N. D. Riley, A. W. Richardson, Dr. E. Scott, Dr. D. W. Seth-Smith, C. D. Sherborn, Dr. H. D. Smart, A. E. Stafford, H. Stringer, E. E. Syms, G. Talbot, W. H. T. Tams, Rev. J. E. Tarbat, E. Taylor, E. Terzi, J. le B. Tomlin, A. E. Tonge, H. J. Turner, C. J. Wainwright, Comm. J. J. Walker, Col. R. M. West, Rev. G. Wheeler, Rt. Rev. W. G. Wittingham, Rev. Preb. A. P. Wickham, V. R. Wigglesworth, D. S. Wilkinson, H. R. Williams, C. G. M. de Worms, C. Worssam, L. H. Bonaparte Wyse.

REVIEWS. 51

REVIEWS AND NOTICES OF BOOKS.

A Practical Handbook of British Beetles. By Norman Joy, M.R.S.C., L.R.C.P., F.E.S., M.B.O.U. Witherby, 2 vols., 3 guineas.— It may, perhaps, be permitted to an orthopterist to offer a few observations on this remarkable work. Dr. Joy has devoted an immense labour to its compilation over the last twenty years or more. He was inspired by the fact that Canon Fowler's work was not compact and had no synoptical tables for the major groups, which makes an orthopterist wonder, for no systematic work of importance on that order without such table had appeared since Brunner introduced them fifty years ago.

Anticipating the criticism of his colleagues because he has, in his own words, "returned to an older method of classification which the author considers more practical," he quotes in defence such eminent authorities as Sir Guy Marshall for sanction to use a key as opposed to a classification, and General St. Claire Deville, who, in a particular instance (the Alaeocharinae), hints at the possibility of the key eventually

proving to be the scientific system.

But supposing his key is not scientific? What of it? The subtitle of the book is "Tabulated and Illustrated." It is, in fact, a tabulation, not a classification. He disarms criticism by disclaiming any pretensions to a scientific monograph and he should be judged only on his own claims. Does he help us name our beetles? If so, hats off to him, for that has been his sole object. If he places the Brachelytra at the beginning, it does not mean that he considers them either the most primitive or the most advanced form of beetle, but only that they are of such distinctive appearance that any fool can recognise them at a glance even in the field. Similarly with the Gyrinidae. Logically, it is an ordinary process of elimination, just as though he had started his classification like this.

(1) (2) Males with enormous jaws ... Stag Beetles.

(2) (1) Males with ordinary jaws ... Others.

That may not be scientific, but it would enable a beginner to tell

whether his capture is a stag beetle or not.

For Dr. Joy is a utilitarian unshamed and claims to be nothing else. He has avoided certain characters merely because they are inconvenient; he prefers those which can be illustrated by figures, which do not involve highly skilful dissection, nor even, if possible,

ungumming from a card.

He claims, too, to be a pioneer in the use of the aedeagus as a specific character, presumably in the Coleoptera, which, incidentally makes an orthopterist sigh for uniformity of classification. Judging by analogy, this should afford extremely useful characters, though presumably little is known of individual variation in these organs. Still, they must to a certain extent be a definite mechanical hindrance to inter-breeding. Nor does he mention the soft parts, which must offer valuable, though difficult, characters.

By economising space to the utmost, by avoiding characters that cannot be used for the immediate purpose of identification, he has been able to condense into one volume of synoptical keys the 3560 species of British Coleoptera, which is 300 more than Canon Fowler knew.

It is, in fact, in as compact a form as possible, a vade-mecum of British beetles, though only a stalwart entomologist could take it into the field with him. The figures, in a separate volume, seem very clear, as though showing up points of importance. They alone represent a great labour, as 1650 of them have been drawn by the author himself.

He seems to have achieved his object, which has been not to write a monograph, which it is not, but to make a handbook, which it is, in the simplest, most practical form. To what extent he has really succeeded in this extremely difficult task can be proved only by the touchstone of experience and actual test.

The publishers have done their work nobly. The price is a good deal of money, especially nowadays, but the work is not for one year

only, and the information cannot be dear at the price.—M.B.

THE LEPIDOPTEROUS FAUNA OF ALBANIA. By Dr. Hans Rebel and Dr. Hans Zerny, Vienna. Large quarto. 126 pp, 1 plate, 1 map.— This extremely well got up and arranged work is an admirable report of the Lepidopterological observations made in Albania in 1918 by the members of the Expedition sent out by the Academy of Science, Vienna. In the report the results of all previous collecting in the same area have been incorporated, and a really comprehensive account has been produced. The introductory portion has been arranged on the same useful and instructive plan which one finds in Dr. Rebel's previous works on the Lepidopterous Fauna of Balkan-lands. There is a useful Geographical Sketch of the country, followed by a note on the Lepidopterous peculiarities of the adjoining territories, Montenegro and Macedonia, then come summaries of the faunal character of Albania; endemic species 21; Eurosiberian species 618; Alpine species 63; Boreal Alpine species 30; Mediterranean species 136; Pontic species 35, and Ponto-Mediterranean species 617; a List of References from which matter has been culled, including a number from the pages of our own magazine, and notes on the various places referred to in the 1500 species are recorded exclusive of many local forms. The inclusion of data concerning Montenegro, Macedonia, etc., have much increased the value of the record. 21 new species and forms are The immense described, most of which are figured on the plate. amount of research for records is simply marvellous, and the whole work will be of untold value to all future workers in Albania, Montenegro and Macedonia. The nomenclature used is that of Staudinger but is illumined in each species, by the insertion in brackets of the genera used by more recent workers, e.u., Aricia, Hirsutina, Iolana, Agriades and others in the omnibus genus Lycaena of old, recognising that such an unwieldy assemblage must be cut up to to be grasped by the mind. We understand that Dr. Rebel has now completed his term of duty in the museum—we wish him a long and pleasant relief from official duties. The younger and most able Dr. Zerny will be a worthy successor to Rebel and we look forward to a continuance of the able memoirs which for so many years have been coming from the Viennese Lepidopterists.—Hy.J.T.

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CONTENTS

0011121110		
Lepidoptera at Dieulefit, 1930 and 1931, Wm. Fassnidge, M.A., F.E.S.		53
Aigle and the Rhone Valley, 1931, Lt. E. B. Ashby, F.Z.S., F.E.S.		55
Notes on Algerian Butterflies; Kabylia, Miss L. M. Fison	• •	58
Mosley's Original Descriptions		60
George Crabbe 1754-1832, H. Donisthorpe, F.Z.S., F.E.S	• •	61
Notes on Collecting.—Lepidoptera from Salonika, Dr. G. S. Robert Uhlunga typica (Pentatomidae), J. Sneyd Taylor, M.A., D.I.C., F.E. P. globulariae and P. cognata, W. G. Sheldon, F.E.S.: Manatropos, C. Nicholson: Additions to the Irish List, Rev. Canon S. Foster, B.D.	.S.: duca	61
CURRENT NOTES	• •	64
Nomenclature, Hy.J.T		65
REVIEWS.—" Butterflies of Columbia" by A. H. Clarke: Biology of Spic by E. Nielson	ders,	67
OBITUARY.—J. J. Joicey; R. South	• •	68
SUPPLEMENT British Nocture, H. J. Turner, F.E.S., F.R.H.S.	(221)-((224)

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"ENTOMOLOGIST'S RECORD" Publications.

Lepidoptera at Dieulefit (Drôme) in April, 1930 and 1931.

By WM. FASSNIDGE, M.A., F.E.S.

When my wife and I chose the small village of Dieulefit, of 3,600 inhabitants, in the entomologically unknown Department of the Drôme. as the place where we would like to spend the Easter holiday of 1930, we certainly had no intention of paying a second visit. But the finding of one or two interesting insects, coupled with the fact that 1930 was a very late season in that region, and further strengthened by our stumbling on a very pleasant "pension," induced us to go there again in 1931, in order to explore more fully the possibilities of the locality. while at the same time gathering material for the solution of at least one of the problems raised. Dieulefit is quite a small village in a lateral valley about 15 miles east of the Rhône at Montélimar. It lies at the end of a "tramway," which has now been replaced by a motorbus service run by the same company, in the foothills of the Basses-Alpes at no great altitude, and the mountains in the vicinity range from about three to four thousand feet in height. One higher mountain is to be seen from the town—La Lance—which reaches over five thousand feet. For the most part the hillsides are steep and stony, dry and rather barren, with here and there oak scrub, pines, juniper, viburnum, Even in April there is not much water in the streams, and no doubt later in the year the vegetation on the hillsides suffers much from drought. In April, 1930, the season was a late one, but in 1931 it was more normal, possibly even a little earlier than usual. In both years we spent about three weeks at Dieulefit, staying at "Le Jas," a pension run by Mlle. Barral, where we found ourselves very comfortable at a moderate price, being especially delighted with the spacious gardens gay with flowers of every kind.

I have already said something concerning three insects bred from galls on juniper found at Dieulefit (Ent. Rec. XLIII., 1931, p. 34), namely, Poecilonota festiva, L., Laspeyresia interscindana, Möschl., and Synanthedon spuleri, Fuchs, and propose now to add further observations made in 1931 to what I wrote there. One of my reasons for revisiting this locality was to investigate these juniper galls, though as my wife had already decided that she wished to spend another holiday there, perhaps it was just as well that I was able to agree so readily. began at once in dull and windy weather to search on the junipers that grow so abundantly on every hillside and in every stony valley all around the town; we continued the process at intervals and I made notes on the spot. The hammer headed larva of the lovely green Buprestid, P. festiva, L., did not seem to be so common as in 1930, but still was plentiful enough, feeding in a flat burrow between the bark and the wood in stems of moderate thickness, and stuffing the mine behind it full with tightly packed sawdust-like frass. I soon learned to distinguish its mine from any other, and only bred two specimens this year, brought home by chance, as I did not want them. I found the beetle larva and the Aggeriid larva mining together occasionally, and the beetle larva and the Tortrix larva mining together rather more frequently. Normally, however, the beetle larva was all alone, and the swelling caused by it was not at all conspicuous, only the brown needles

on the half dead twig betraying its presence. I did not once find two

beetle larvae mining in the same stem. The Tortrix larva, which has kindly been identified by Mr. E. Meyrick from insects bred in 1930 as Laspeyresia interscindana, Möschl, was very common. On April 5th, I found it mostly full fed or nearly so, sometimes spun up for pupation. twice already changed to pupa, in a silk lined chamber scooped out of the wood just under the bark. Fine reddish frass betrays its presence as well as the slight swelling of the stem. Twigs of all sizes are affected, sometimes quite thin ones only a quarter of an inch thick below the swelling. The larva is yellowish white, with a chestnut brown head and paler two-lobed neck shield, but no sign of an anal plate. Often there are three or even more larvae in one twig and but rarely only one. It is very frequently parasitised, and one may see the hymenopteron fully formed within the pupa. I carelessly did not note that Kennel in his great work on the Palearctic Tortrividae does not mention the larva of L. interscindana, or I would have made more voluminous notes on it when I had the opportunity. I have no doubt whatever that this species is the sole cause of the slight swelling observed, but I cannot say if the swelling deserves to be ranked among the galls. The Aegeriid larva—that of Synanthedon spuleri, Fuchs, stated to be conspecific with S. tipuliformis, Cl.—was only moderately common although its old workings were comparatively abundant. In early April the larvae were of varying sizes, some being still quite small, while many were spun up for pupation, some few having already changed. The pupal chamber is formed well within the stem and lined with silk. It greatly weakens the thinner stems at that point so that there is great danger that they will break if carelessly handled, damaging the pupae. Apart from risk of damage there is no great harm done, for I succeeded in breeding a good proportion of pupae extracted from their mines. The smallest larvae were about three eighths of an inch in length, in borings just under the bark, rather more transparent than larger larvae, and having a reddish alimentary canal. They are quite easy to distinguish from the Tortrix larvae, which occur fairly frequently in the same swellings. I think these smaller larvae would feed up and emerge in the same season, though it is not possible to make a definite statement. Emergence in captivity is spread over a considerable period, as is often the case with Aegeriids, and almost certainly the species has only a one year cycle. I found this species in stems of all sizes, often in stems from which insects had emerged in previous years, in which case they were boring lower down in the stem nearer to the living wood, and not above the gall where the stem was dead or dying. Several times I found two or three larvae together, and a few times more than three. They are very heavily parasitised indeed. Old mines are easily found because of the dead and brown needles, but I found several larvae in galls where the stem was still quite living and the needles still almost as green as ever. These stems must have been only recently affected, and would not die away until after the first tenants had emerged. Many times I found the remains of the pupa case, sometimes even the complete case, projecting from stems containing one or more living larvae. Clearly the affected stem is used for several years by successive generations. The swelling thus caused is sometimes a very conspicuous one, for in September, 1931, I found these larvae at San Juan de la Peña, near to Jaca, in Aragon, feeding in stems as thick as my wrist, causing galls more than eight inches in length and four inches in thickness. I have no reasonable doubt that these swellings are caused solely by the larvae of S. spuleri, which must certainly be maintained on the short list of gall-making lepidoptera. One very curious and welcome find came to break the monotony of the search for these juniper galls. After cutting off a galled stem I discovered that I was grasping a fine large cocoon of Hoplitis milhauseri, Fb., fixed to the stem close above the gall, from which cocoon a fine large female duly emerged as late as July 1st, at 4.30 p.m. Before leaving the subject of juniper galls, I ought to state that in spite of the rather large number of larvae necessarily spoiled by my investigations, yet I brought home a sufficient number of galls to yield a long series both of the Aegeriid and of the Tortrix. One other insect also emerged from these juniper twigs, namely, a single specimen of Laspeyresia juniperana, Mill., which is well known to feed on the berries, and doubtless had simply found a convenient spot for pupation in one of the mines.

One other Aegeriid rewarded my search at last, Sciapteron tabaniformis, Rott., a species I have sought for in vain in many localities in France. I found full fed larvae and pupae low down in young shoots of lombardy poplar growing in the open far from the parent trees, and bred two moths. Although this species has long been known as a gallmaker, these larvae had not caused the slightest swelling, and the

copious frass extruded alone betrayed their presence.

(To be concluded.)

Aigle and the Rhone Valley, Switzerland, in May, 1931.

By LIEUT. E. B. ASHBY, F.E.S., F.Z.S.

Leaving London at 2 p.m. on May 9th, I arrived at Aigle station via Paris and Vallorbe at 9.1 a.m. on the following day. I decided to stay again at the Hotel Beau Site, because of its immediate proximity to Aigle station, and I was made very comfortable there during the

whole of this trip.

May 10th.—I went out before and after déjeuner, but my bag only included the Butterflies, a & Carterocephalus palaemon, and 3 Leptosia sinapis, the Bombilius fly B. discolor; and two specimens of Chrysotoxum festivum, L., the Coleoptera Carabus auratus, L., Cocinella bipunctata, L., var., and Corymbites purpureus, Poda., the Hymenoptera Halictus laticeps 2, Eucera longicornis, and the Rhyncotid Triecophora dorsata, Germ. This last is new to the British Museum collection at S. Kensington, and more specimens are wanted. The B.M. is rather weak in Triecophora species in general. T. dorsata is to be found in Spain, S. France, Switzerland, Italy and Dalmatia. The country was looking exceedingly pretty and the weather was fine, tempered with a nice breeze. I also took a single specimen of the bee Bombus hypnorum, L. = meridiana, Panz., for the first time.

As I imagine that English collectors might very easily overlook this bee I give the following description of it by Dr. Schmiedeknecht, viz.: "Bombus hypnorum, L., is so characteristically coloured, that a mistake cannot occur. Only Bombus gerstückeri and Bombus hortorum var. consobrinus have any resemblance. In the female the head in front is blackish-grey, above the thorax it is covered with hairs of a fox-red colour. The black hairs of the abdomen appear dull on account of

interspersed greyish hairs. The whole underside is black with intermingled yellow-grey hairs. Segments 4 to 6 dingy white, segment 6 rather bare, underneath at the extremity covered with short fox red hairs. Legs black, the tarsi yellow-grey. In Germany the females nearly always have a black abdominal base, on the other hand the fore segments in the males are mostly rust-red coloured, less so in the workers. Varieties, in which the thorax is partially coloured black, appear to be very rare, I at any rate have never come across such.

"Bombus hypnorum moreover nowhere belongs to the over abundant species, but occurs everywhere in the northerly and central regions. I have noticed, that the species is extraordinarily variable in its occurrences. Thus it was, about 10 years ago, not exactly rare at Gumperda, but disappeared in the following years, so that for about 8 years I came across no specimen. In the year 1880 it occurred very suddenly again rather abundantly and single specimens occurred in the last two years. The females appear here about the middle of April and seek by preference the blossoms of gooseberry bushes. They also visit other spring flowers, such as Anchusa, Lamium, Taraxacum, etc. The workers have an especial preference for the flowers of Rubus and are met with there in company with pratorum and scrimshiranus. males appear from the end of August. They may then be found freely on thistles, very freely also on Epilobium augustifolium and Solidago. On the latter flowers especially in company of the male of Bombus lapidarius.

"They are rather inactive. The nest above the ground."

Patria: Europa borealis et centralis.

From "Apidae Europaeae" by Dr. H. L. Otto Schmiedeknecht,

Gumperda in Sachsen.—Altenburg. 1882.

May 11th.—This morning I walked up the Sepey road for several kilometers and then turning down to the right of the road on to a wooded footpath I found a collecting ground well shaded from the morning sun. Here I found some nice Aglaia tan in good condition; L. sinapis, Nisoniades tayes, Brenthis euphrosyne, Polyommatus semiargus males only, and Hesperia malvae among the butterflies. Papilio podalirius and P. machaon were also flying but were out of reach.

The Coleoptera Telephorus rustica, Fall., Cicindela hybrida, L., Necrophorus mortuorum, F., the beautiful longicorn Apanthia cardui, L., Cetonia hirtella, L., Malachius aeneus, L.; the Hymenoptera Chalicodoma muraria, F., Psithyrus vestalis, Fourc., and Andrena hattorfiana, Fab.; and the Dipteron Syritta pipiens; the moths Melanippe sociata, Bork., Bapta temerata, Hb., and Boarmia repandata. At night the beetle Melolontha vulgaris 3, flew into my bedroom with great noise. In the morming I also took the Ants Formica sanguinea,

Latr. and Camponotus ligniperdus.

May 13th.—This morning by train to St. Triphon at 8 a.m. Thence by walking along a track directly parallel to and north of the railway in due course I reached the banks of the River Gryonne. These banks I found better up stream, rather than down stream, as the section where the Gryonne joins the Rhone and the Rhone banks themselves produced practically nothing. Working up the Gryonne banks against the stream I found Hamearis lucina, the "blue" L. cyllarus in some abundance and both sexes, some fresh C. palaemon, Polyonmatus thersites, Cant., a few of both sexes but in splendid condition; Cupido

sebrus, P. icarus; the moth Lobophora halterata, Hufn., $\mathfrak P$; and the Neuropteron Ascalaphus longicornis in abundance; also the Rhyncotid Carpocoris purpursipennis, De Geer, on bushes in some numbers by the River bank.

After walking back along the banks of the Rhone, a most fruitless journey, I came to some woods alongside the Rhone, and just opposite to St. Triphon these produced a nice fresh series of C. palaemon; the Coleoptera Trichodes alrearius, Fabr., Pyrochroa serraticornis, Scop., Phyllopertha horticola, L., Melanotus vittatus, F., Abax striola, F., and Leptura aethiops, Poda; the Hymenoptera Arge enodis, Tenthredella solitaria, Scop., and the ant Formica pratense, Ritz.; Macrophya ribis, Schrk. and Syrphus ribesii, L., and the Diptera Empis tessellata, Fabr., and Chrysotoxum italicum, Rond., and the Neuropteron Philopotamus gudificatus, Mch. After midday the heat was pretty awful and I was glad to rest and take the afternoon train back from St. Triphon station to Aigle. I may mention that the road electric tramway Aigle—Ollon -Monthey serves this locality just as well and provides a more frequent stopping service than the Railway. It was interesting this morning to watch Ascalaphus longicornis emerging in great numbers along the banks of the River Gryonne. When the wings first begin to grow they are of a pale yellowish green, the distinctive colorations appearing later, but in short duration.

May 15th.—To St. Triphon station this morning early. Then I found the road which leads through the Charpigny Estate, only a short distance from the Railway, to the north of it. I spent several hours on this rocky eminence and took Erebia medusa quite fresh, also Heodes dorilis; Melitaea cinxia; the moth Aglia tau; and a few Coleoptera, amongst them Telephorus rustica, Fall.; and the Hymenoptera Tenthredella temula, Scop.; Chalicodoma muraria, F.; Bombus pratorum, L.; B. sylvarum, L.; Odynerus pictus; Bombus subterraneus (latreillellus); and the Diptera Chrysotoxum fasciolatum, M.G., a beautiful fly. Cupido minima was conspicuous amongst the Butterflies, and I saw several P. machaon, but they were elusive. The day was very hot, and the only one or two men I saw walking through the Estate seemed too much affected with the heat to take any notice of me. There is suitable collecting ground throughout the length of the road which winds around the Estate, which appeared to have hardly altered at all since I was last there by the courtesy of the late Monsieur Fison, in July 1909, a day which I shall never forget.

May 16th.—This morning I spent on the sloping marshy pastures between the Grand Hotel, Aigle, and Ollon. I took the following in superb condition $H.\ dorilis$, both sexes; $P.\ semiargus$, males only; $M.\ cinxia$, and $P.\ icarus$. I noticed also the moth $Aglia\ tau$, and $Erebia\ medusa$. There is a small pond in the area, to the right of the road around which a number of Dragon Flies were flying, but they managed to keep out of reach. I took the Rhyncotid $Syromastes\ marginatus$, $L.\ At\ night\ a\ male\ and\ female\ of\ the\ moth\ Melanippe\ procellata\ flew$

into my bedroom.

May 17th.—Today by the River Gryonne, which flows into the Rhone between St. Triphon and Bex, and in the marshy fields adjoining the River for some distance *Erebia medusa* was becoming more abundant, and *Melitaea parthenie* was just emerging. A nice number of *P. thersites*,

both sexes and in good condition were found settled on *Onobrychis sativa* by the banks of the Gryonne. *P. icarus* were also in the same situation, I thought not so common as *P. thersites*; I took one specimen of the moth *Lithosia sororcula*. The day became stormy about 3.0 p.m. and ended in torrents of rain from 5.30 p.m. onwards after my return. *Zygaena achilleae*, Esp, were beginning to emerge.

(To be concluded.)

Notes on Algerian Butterflies with Special Reference to some Localities in Kabylia.

By Miss L. M. FISON.

(Concluded from page 8.)

The genus *Vanessa*.—Apparently the "Peacock Butterfly" (V. io) does not exist in Algeria. I have never seen it nor have I found any record of it.

Pyrameis atalanta.—Not uncommon in Kabylia. It seems to fly early and late. I have seen it as late as December, and yesterday, January 22nd, 1931, I saw one near a Kabyle village at a height of about 3000 ft. above sea-level. It must have been a hibernated specimen—which the first sunny day had brought out after weeks of torrential rain, snow and sleet. Michelet itself is placed at a height of 1132 French metres above the sea, and in winter we are frequently blocked with snow which lies at a depth of anything between 30 centimetres to 1 mètré 50.

P. cardui.—Common in the valley of the Sebaou. (L.M.F.) Plateaux, Tell, Sahara, Biskra and Blida. Sometimes in great numbers.

Eugonia polychloros.—Azazga, Djidjelli, Port Gueydon, Mékla, Michelet, Yakouren; also I think E. erythromelas.

Euvanessa antiopa.—The "Camberwell Beauty" I have seen only occasionally in the forest of Yakouren. (L.M.F.)

Polygonia egea.—Azazga, Michelet, Valley of Oued, Djemaâ, Mékla.

P. c-album.—The same localities.

Melitaea aurinia subsp. iberica.—N. Africa, no locality given, I have never seen it yet. (L.M.F.)

M. desfontainii.—The Tell.

M. aetherie subsp. algerica.—Tlemçen, Teniett, Plateaux and Tell.

M. phoebe.—Tlemçen, Lambèse.

M. didyma.—Plateaux, Tell, Sahara, Michelet, Oued, Djemaâ.

M. didyma subsp. deserticola.—Biskra and Teniett.

M. deione.—Not seen.

M. cinxia.—Not seen.

Issoria lathonia.—Valley of the Sebaou, mountains above Fréha. (L.M.F.)

Argynnis aglaia.—Not seen.

A. adippe.—Kabylia. Probably subsp. auresiana.—Valley of the Sebaou. (L.M.F.) Aurés Mts. and Plateau.

A. paphia and A. pandora.—Both in woods near Azazga. (L.M.F.) Aurés Mts., Plateaux, Blida, Teniett, Sebaou, Tlemçen, Oran.

The interesting and beautiful genus Erebia does not seem to exist

in North Africa, although of course probably the extreme heights of the Atlas Mountains have as yet not been much worked.

Libythea celtis.—I have not as yet found a specimen of this butterfly,

but probably because I have not paid sufficient attention to it.

Neither the "Purple Emperors" nor "White Admirals" seem to exist here. The "Hairstreaks" were remarkably abundant in two localities with a profusion of rare "blues" in June and July, 1921, in a ravine near Djemaâ Sahridj. I would especially recommend this locality to any entomologist who should visit Kabylia. In 1922 again they swarmed in a wood near the river Sebaou, close to the village of Aboubrouu half-way between Azazga and Mékla at the end of May, June and July, 1922. I should be very pleased to direct any entomologist to these two localities should they wish to visit them.

They are the best I know for these species and undoubtedly an expert would discover interesting secrets in both these local spots.

Also in Azazga forest. (L.M.F.)

Strymon (Thecla) ilicis.—Guelma, Souk Ahras.

Zephyrus quercus subsp. iberica.—Sebdou.

Cigaritis zohra.—Guelma.

C. siphax.—Teniett.

Thestor ballus.—Abundant each year in the valley of the Sebaou, Azazga, Mékla, Michelet, Aggribbes, Port Gueydon. (L.M.F.) Blida, Kantara, Lambèse, Bougie, Algeria, Constantine and Hammam.

T. mauretanica.—Algiers, Lambèse, Mustapha Supèrieur,

Constantine.

Rumicia phlaeas.—Valley of the Sebaou. (L.M.F). Lambèse, Constantine, Biskra, Blida, Oran, Tlemçen, Hamman. f. eleus.—Guelma.

Lampides bocticus and Syntarucus telicanus.—Both, I think, very abundant in the two localities mentioned with the "hairstreaks" with a lot of other blues, which I could not identify—as I had never seen specimens in Europe and I have never seen an Algerian collection. Very interesting localities to entomologists. (L.M.F.) I shall hope to re-visit these spots this year.

Tarucus theophrastus.—Teniett, Sebdou, Kantara, Souk-ahras.

Zizera lorquinii.—Teniett, Blida, Tlemçen. Plebeius martini.—Lambèse, Teniett, Cascade.

Scolitantides baton (=vicrama).—Kantara, Hamman.

Everes argiades .- Blida.

Aricia medon.—Lambèse, Michelet.

Polyommatus icarus.—Valley of the Sebaou, Michelet, Mékla, Azazga. (L.M.F.)

P. thetis (bellargus).—Sebdou.

Glaucopsyche vyllarus.—Hammam.

Lycaenopsis aryiolus.—Spring and summer, Valley of Sebaou, Ait Saâda, Michelet. (L.M.F.)

G. melanops.—Kantara, Blida, Lambèse, Philippeville, Michelet (com.).

Carcharodus lavatherae.

Spilothyrus boeticus.—Guelma.

Erynnis alceae.—Sebdou, Tlemçen, Salda, Maglimi.

Powellia therapne.—Blida, Sebdou.

Hesperia alveus.—Sebdou, Tlemçen, Saïda.

H. onopordi.-Lambèse.

Sloperia proto subsp. mohammed.—Algiers, Teniett, Sebdou.

Powellia sertorius (sao). - Guelma, Michelet.

Thymelicus acteon. - Lallah, Magnia.

Adopaea lineola.-Teniett.

A. hamza.—Teniett.

A. flava (thaumas).-Lallah, Magnia.

Augiades sylvanus.—

Parnara nostradamus, P. mathias, and P. zelleri.—Sebdou.

In conclusion let me say that I fully realise how incomplete these notes are—and how much more ground needs yet to be covered in order to get an adequate knowledge of these localities. These notes are however intended to be merely preliminary to others and we hope year by year to add to them. The primary object has been to suggest localities for further research—and to encourage entomologists more expert than myself to come to Kabylia and discover more about the rich butterfly fauna produced in this beautiful land. A visit of several months from February to the end of June would well repay the eager Azazga, Tizi-Ouzou, Tigzirt and Michelet are certainly good centres from which to work. Probably Kerrata too at the foot of the famous Gorges du Chanet-es-Akra would also prove a good hunting-ground. Kabylia is opening up in all directions with a good communication of trains and motor-buses, etc., and the hotels are quite moderately comfortably. It is therefore with no hesitation that we affirm the Djurjura Mts. of Kabylia to hold secrets well worth unravelling—and secrets which have certainly remained for centuries absolutely hidden to the great majority of the inhabitants of Algeria.

Original Descriptions. By C. Mosley.

Below are the original descriptions of several aberrational forms which have appeared in more or less obscure journals or publications and therefore very difficult for the average worker to obtain.

I. The new forms announced by C. Mosley in the Naturalist's Journal

more than 30 years ago.

Pieris napi ab. aurea, Mrly. Nat. Jr. Sup. p. 6 (1896). The name was given to a coloured figure on plt. 11. fig. 10. from an example in Capper's Coll. Yellow with nervures clouded with grey and the usual females markings on all wings; not the bright canary-yellow. S. of England.

Euchloë cardamines ab. minor, Mrly. Nat. Jr. Sup. p. 6 (1896). "β and β measuring 15 lines in expanse; fairly constant and recurring. It is in many collections: I have taken it at Arnside, and Mr. Barrett says (E.M.M. XXV. 81) it occurred regularly for some years in Surrey, a few days before the ordinary form."

Aricia medon (agestis), Mrly. Nat. Jr. Sup. p. 8 (1896). "Ground

colour below brown. A form of the second brood."

Polyommatus thetis (adonis) ab. pallida, Mrly. Nat. Jr. p. 9 (1896). "The 3 pale lilac, the 2 pale brown." This form occurs on the Kentish coast.

Lycaena arion ab. immaculata, Mrly. Nat. Jr. p. 10 (1896). "With only disc spot," plt. IV. fig. 18.

Aglais urticae ab. pallida, Mrly. Nat. Jr. p. 14 (1896). "Ground straw-colour."

Melanargia galathea ab. rubra, Mrly. Nat. Jr. p. 16 (1896). "Black

markings replaced by red-brown,"

Pararge aegeria ab. bipupillata, Mrly. Nat. Jr. p. 16 (1896). " Tip spot on fore-wings with two white spots."

Pararge megera ab. bipupillata, Mrly, Nat. Jr, p. 16 (1896), "Apical

spot with two white dots."

Adopaea sylvanus ab, pallida, Mrly, Nat. Jr. p. 16 (1896). "The ground colour being of a yellowish bone-colour.

Adopaea comma ab. pallida, Mrly. Nat. Jr. p. 17 (1896) pale. Adopaea lineola ab. pallida, Mrly. Nat. Jr. p. 17 (1896) pale.

George Crabbe 1754-1832.

This year is the centenary of the Poet Crabbe.

Everyone of course, has heard of him as a poet, but I should

imagine that very few people know that he was an entomologist!

He was born at Aldborough, in Suffolk, on December 24th, 1754, and was brought up to be a doctor, but he soon gave up the medical profession, and took to literature, in which he became eventually distinguished.

In 1781 he qualified himself for holy orders, and became domestic chaplain to the Earl of Rutland. He had many distinguished friends including Dr. Johnson, Burke, Fox, etc. He was presented with a number of livings, including Muston, and Croxton Kerrial, in Leicestershire. It was in Leicestershire that he did much of his collecting, and he published an essay on "The Natural History of the Vale of Belvoir" which was written for "Nichols's History of Leicestershire" (1795). The part containing the Coleoptera in this paper was reviewed by the writer in the Transactions of the Leicester Literary and Philosophical Society 4 198-200 (1896). I came across this paper when taking notes for the Donisthorpe pedigree in Nichols's History.

Crabbe evidently had a very fair idea of Natural History and also a knowledge of the various works on Entomology then extant. Thomas Marsham's "Entomologia Britanica" several beetles are given as "Ex mus D. Crabbe." It would be interesting if possible to find out what has become of this collection. To mention some of his Poems the best known are "The Candidate"; "The Village"; "The Borough," perhaps his best; "Tales in Verse"; and "Tales of

the Hall."-HORACE DONISTHORPE.

COLLECTING. OTES \mathbf{O} N

Notes on a few Lepidoptera from Salonika.—It may be of interest to record a few insects I took in Salonika in 1918 and early 1919; as the box containing them was mislaid, until recently, there was no

opportunity to do so before.

Epinephele jurtina and f. hispulla, Polyommatus icarus (type), Tarucus balkanica, Syntarucus telicanus, Coenonympha pamphilus race lyllus, Ocnogyna parasita, Hübn., Euxoa spinifera, Hübn., Euxoa radius, Haw., Cucullia chamomillae, Zamacra flabellaria, Heeger., Cidaria obstipata, Fabr., Celama chlamitulalis, Hübn.

These were identified by Capt. Riley and others at the Natural History Museum, S. Kensington, without whose kind assistance several

species could not have been named.

O. parasita came freely to light in the army huts during the last few days of Dec. 1918 and first week of January 1919—at that time there was a severe frost, and snow was on the ground. Cidaria obstipata was out in February.—G. S. Robertson, M.D., "Struan," Storrington. February 9th, 1932.

A Note on Uhlunga Typica, Dist., (Pentatomidae).—Early in June of last year I found a number of Pentatomid egg-clusters on the leaves of a wild species of fig. (Ficus ingens, Miq.), growing in my garden at Barberton. The egg-clusters were more or less circular in form, and each consisted of a single layer of eggs varying from about thirty to fifty in number. In each case the female Pentatomid was observed resting on the eggs, remaining there, or in close proximity to the eggs, until hatching took place. The nymphs, on hatching, migrated to the fruits where they, as well as adults, were to be found in considerable numbers. The insect has since been determined as being Uhlunga typica, Dist., by Mr. B. P. Uvarov, of the Imperial Institute of Entomology. Dr. Imms in his General Textbook of Entomology, p. 346, under "Pentatomidae," quotes two similar cases with reference to other species. - J. SNEYD TAYLOR, (M.A., D.I.C., F.E.S.), Pretoria, Transvaal.

Procris globulariae and P. cognata.—Dr. E. A. Cockayne in his paper on the early stages of Procris globulariae, Hb. and of P. cognata, H.S. in the Frebruary number of the Ent. Record states, p. 19, "None of the Sussex collectors, who have been breeding it from time to time for many years, seem to have noticed that the larva they found was quite unlike that described in all our books." I am afraid Dr. Cockayne hardly gives the credit to at least one Sussex collector that he deserves. If he will turn to Entomologist Vol. LIV. (1921) p. 240, he will find there a note by myself on this larva in which I state "I am indebted to the kindness of Mr. F. G. S. Bramwell of Brighton, for a supply of larvae of this extremely local moth, and also for pointing out that Buckler's figures and description do not agree with British examples of the larvae."

Dr. Cockayne says "I have found no published description or figure" of the larva. It is true in my short note I did not give a full description, but I did in it point out the differences, as I noted them, between the larvae supplied by Mr. Bramwell, and Buckler's description, and suggested that the difference is so great that I am inclined to think Buckler, who obtained his larvae from Continental sources, must have had some other species.—W. G. Sheldon (F.Z.S., F.E.S.), "West Watch," Oxted. March 4th, 1932.

More about Manduca atropos.—Adverting to my note on a larva of this species, found on privet in this village on August 19th last and recorded on p. 157 of last volume, I think it will be desirable to give its further history. The larva duly pupated in about a fortnight after it went down in a pot of soil on the 21st and was left in the pot covered with the soil, but under a "tent" of cardboard to prevent the

soil from pressing on it. It was kept thus in a cold, but frost-proof, room with a north aspect and I decided to try the experiment of leaving it thus for at least several months, as I had no bellglass, or similar convenience, for forcing it in the recognised way. Every few weeks the pupa was inspected and touched, and it responded vigorously with tail turnings and twitchings until about the middle of December it occurred to me to try a little mild forcing on it. It was therefore established in an old breeding cage, made out of a "50" cigar box with perforated zinc sides, ends and lid. This was stood on end and fitted at the "bottom" with a small tin box containing damp earth on which several layers of newspaper were laid and finally a piece of tissue paper; on this the pupa rested quite exposed, and remained so (with occasional soakings of the earth with warm water, to prevent the pupa from being chilled) between the hot water cistern and the wall in our kitchen airing cupboard at a temperature varying between 65° and 80° Fahr., until a fine male of the intermediate form emerged in the evening of February 15th. Next day I took it in the box to show such of the villagers as were interested, and all were much impressed with its handsome, but uncanny, appearance and said they had never seen such a moth before. It was perfectly quiescent, probably on account of the prevailing chilly weather, and I could not induce it to squeak. I kept it alive, still in the box, until the 21st, when, as it had not moved and seemed torpid with the cold. I put it in the cyanide bottle.—C. NICHOLSON, Tresillian, Cornwall.

Criticism, Corroboration, Additions to "Recent additions to Irish Fauna and Flora" Proc. Roy. Irish Ac. XXIX. Sect. B. No. 1, pp. 19-20 (1929)—Eucosmia cruciana, L. (angustana, Hb.).—Among willows at Narin and Portnoo, Co. Donegal, August, 1930, but Meyrick says, "Britain to the Orkneys, Ireland, common," p. 546. Kane gives a long list of Irish localities. Argyroploce semifasciana, Hb.—Abundant at Inch, Kerry, July, 1905. A. corticana, Hb.—One in woods skirting Carrig Mt., Co. Wicklow. Meyrick, "Britain to Ross, local." June, 1925. A. profundana, Fb.—Rathdrum, Co. Wicklow, August, 1924. A. micana, Fröl.—One, Caragh, Co. Kerry, June, 1912.

Of the following I can find no previous records. Encosma crenana, Hb.—Kilclief, Co. Down, August 17th, 1929 (Identification doubtful). Meyrick, "North of England, Perth." Therefore Co. Down, is a likely locality. Penthina staintoniana, Barr. (grevillana, Curt.).—One at Powerscourt, Co. Wicklow, June, 1924. Meyrick, "Perth to Sutherland, local. Not recorded elsewhere." Simaethis pariana, Clerck.—One at Donegal Town, August, 1931. Meyrick, "Britain to the Clyde, local." Platyptilia calodactylus, Schiff. (zetterstedtii, Zell.) (taeniodactyla, South).—One at Valentia, Kerry, on the road beside the old reservoir, June, 23rd, 1928. Meyrick, "Kent, Devon, Cornwall, local." Tinea semifulvella, Haw.—One Strangford, Co. Down, July, 4th, 1930. Meyrick, "Britain to Perth, rather common.

The only really remarkable record among the above is that of P. staintoniana, as it is a long hop from Perthshire mountains to Co. Wicklow. Mr. A. Stelfox says, however, in a letter on the subject, "Wicklow is full of Northern Hymenoptera so you need not be surprised to get a Scottish type of micro there." However, as regards the other four insects, the sea is the only gap, while with staintoniana

there is not only sea, but wide stretches of land, intervening. As regards calodactylus, for example, Kerry and Cornwall are closely connected botanically and zoologically, and Gnophos myrtillata (obfuscaria), Entephria flavicinctata and Nyssia zonaria show the same connection between N. Ireland and W. Scotland .- (Rev. Canon) G. FOSTER (B.D.), Strangford, Co. Down.

CURRENT NOTES AND SHORT NOTICES.

A Meeting of the Entomological Club was held at "Caracas," Ditton Hill, Surbiton, on March 3rd, 1932, Mr. W. J. Kaye in the Chair. Members Present in addition to the Chairman: -Mr. Robt. Adkin, Mr. Jas. E. Collin, Mr. H. Donisthorpe, Dr. Harry Eltringham, Prof. E. B. Poulton, Mr. H. Willoughby-Ellis. Visitors Present:— Mr. J. A. Simes, Mr. G. C. Leman, Mr. C. H. Lankester, Dr. Karl Jordan, Mr. C. N. Hughes. The guests were received by Mr. and Mrs. Kaye, and Tea was dispensed by Mrs. Kaye. The comprehensive and interesting collections of Lepidoptera were on view throughout the evening. Supper was served at 8 o'clock. During the evening it was announced that Dr. Karl Jordan had been nominated a Fellow of the Royal Society. A very successful and most enjoyable evening was spent.—H.W.-E.

Our readers will no doubt have been surprised that the review on Dr. Joy's recently published Hand Book of British Beetles (anteap. 51) was written by our sub-editor for Orthoptera and not by myself. I may mention that my friend Dr. Burr asked me first if I minded if he wrote a general review on the above work, as he had half promised Dr. Joy he would do so, and I of course replied that I did not mind. The Entomologist's Record was not given a copy to review as were its two contemporaries, one of which does not now cater for the coleopterist while the Ent. Record does. In these difficult times the price of the book is almost, if not quite, prohibitive to most working coleopterists. Moreover the Record has as large a circulation abroad if not larger than either of its contemporaries. The publishers however know their own business best, it is the author that suffers generally in restricted issues. The chief point, however, is this—the whole object of the book is to enable beginners, and others, to easily identify their beetles with the use of its tables. No one could properly, or fairly, criticise this work until he, and others, have used the tables for some months, and not just dipped into it, here and there. If this object is attained then as my colleague says "Hats off to him"! but if on the other hand it is not, then the book is worthless, an unnecessary expense, and a woeful waste of time. I propose later to publish a critical review in our magazine, and shall be much obliged if any Coleopetrist who has used the book will let me know what his experience is with regard to the tables.—H.D.

A List of the Butterflies and Moths of Folkestone (Macro-Lep.) by A. M. Morley, M.A., 1/- (Folkestone Natural History Society). No doubt the List will be found useful to those lepidopterists visiting this neighbourhood. It is a List only with scarcely any information beyond "local," "scarce," etc., an occasional localisation, and a very occasional line of real information. Some so-called English names are given. The real names are given from Seitz Pal. Lepidoptera.

Several errors have crept in partly owing to the printer and partly that it was not checked by one of our up to date lepidopterists. We note megaera, hyperanthus, corydon, astrarche, sibylla which are modern unnecessary alterations in place of the originals megera, hyperantus, coridon, medon, sibilla. We British always use aegon (as Seitz notes to be preferable). Lubricipeda should now be replaced by the prior lutea. Chrysorrhoea by phaeorrhoea the prior name. Derasa was shown a decade or more ago to be pyritoides, and Rothschild long before showed that Macroglossa should be the prior Macroglossum. Curtis spelled litoralis from Latin litus, a shore, and not from the Italian littorale. Apamea nicitans speaks for itself. Cosymbia puppillaria (porata) was funny; the porata intended was on the next page of Seitz. We rather think that all our modern British collectors use South's 3 Vols. and that the List would have been better based on them, in spite of the want of Indexes.

The Supplement to Seitz Palaearctic Macrolepidoptera is making steady progress: Parts 30 and 31 are recently to hand. Part 30 continues the additions to the Bombycids, the species found in Britain to which additions have been made are Diaphora mendica, Diacrisia sannio (14 names), Arctia caja (41 names), A. villica (12 names), Callimorpha dominula, C. quadripunctaria, Hipocrita jacobaeae, Dasychira fascelina (6 names), Orgyia antiqua, Lymantria dispar (13 names), L. monacha and Euproctis chrysorrhoea. Those working with the polymorphic species A. caja and L. dispar connot dispense with the matter contained in this part, showing what an amount of study has been put into almost every species since our late editor initiated the intensive study of aberration and variation. Part 30 continues the additions to the Agrotids by Dr. A. Corti, with 2 plates containing no less than 111 very good figures of forms of various species of Euwoa. In the 4 pp. of text of this part the only species found in Britain is tritici of which the author notes the extreme variability and remarks that possibly some aberrations may turn out to be good species. author says "Other denominations of aberrations by Tutt and other English authors appear to me absolutely unjustified as they only refer to quite unimportant colour and marking aberrations and cannot be clearly separated from one another." The var. pseudogothica, P. Curt. is both described and figured as a local race of Britain.

In the Int. Ent. Zeit. for February 1st is an article on "Melanism in Butterflies" by Dr. Walther, and in the report of the Verein Apollo

a summary of aberration in Mimas tiliae.

Nomenclature.

Linneus in Systema Nat. Ed. X., p. 505 (1758), described under the name lubricepeda two forms which were subsequently proved to be two species. He numbered these (a) a white form and (b) a yellow form. Subsequently Hufnagel, Berl. Mag. II., p. 412 (1766), revised this and naturally named the (b) the yellow form, as lutea, properly restricting the name lubricepeda to the first form the white. This white form was redescribed by Esper as menthastri, Schm. Abbild. III. 334, plt. 66 (1786). Unfortunately this redundant name was copied

by most subsequent authors, in spite of periodical reminders. In Kirby, Syn. Cat. Het. 227, 228 (1892) the nomenclature is correct. It is much to be regretted that in our latest British authority this repeated correction is ignored.—Hy.J.T.

Nomenclature-Errors IV.

Coleophora lineolea, Haw.—In 1828 Haworth described a species under the name lineolea. The specimens still exist. The description, although possibly sufficient at that date, is very incomplete. Stephens in 1829 copied the description (translated from the Latin) but did not enlarge it, in his Illustrations. In 1850 Zeller from a single example introduced a species under the name crocogrammos with an adequate description, in the Linn. Ent. In 1854, Stainton, recognised crocogrammos, Zell. as the lineolea, Haw., in the Ins. Brit. Tineina, and in Nat. Hist. Tin. IV. verified his recognition by comparison of Zeller's species with Haworth's specimens in the Brit. Museum, 1859. Zeller was joint author of this last volume and must have fully agreed with the correctness of Stainton's judgment. In Meyrick's Hand. 1895, the name lineola is accepted but in the Revised edition, 1928, we get the mutilated name crocogramma for Haworth's lineolea. The larva of this species feed in rough irregular cases on Ballota nigra and Stachus sps.

In Stainton's Annual, 1858, is described another species of the genus Coleophora under the name apicella, the larvae of which feed in neat cylindrical cases on the stichwort seeds, and the species belongs to a different section of this large genus according to Heinemann, Schm. Deutsch. und Schw. In Meyrick Revised edn., the name has been substituted for Stainton's name apicella, a most strange and inexplicable

muddle.

These species should stand Revised Hand. p. 761. No. 54 C.

anicella, Stain. and 55 C. lineolea, Haw.

Note.—It has been pointed out by T. B. Fletcher, Generic names Microl., 52, that Eupista, Hb. should be used for Coleophora, Hb. if the Tentamen of Hübner be rejected finally in the Entomological Rules of Nomenclature now being revised.

Aspilates citraria, Hb.—This should be **Aspitates**, Tr. (a case of wrong copying) ochrearia, Rossi (prior name). Corrected by Prout in Seitz; see Ent. Record List of British Geometers.

Ptychopoda bisetata, Rott. should be **P. biselata**, Hufn. The specific name was copied wrongly by Rottemberg. Corrected by Prout in Seitz.

Corydon, Fb. and sibylla, L. should be coridon, Poda, and sibilla,

Actaeon, Rott. is another strange spelling error or "rectification," Rottemberg wrote acteon.

REVIEWS AND NOTICES OF BOOKS.

The Butterflies of the District of Columbia and Vicinity. By A. H. Clarke, Smithsonian Institute, U.S.A., 1932. 282 pp., 64 plates.—One of the first essentials of a work on a limited fauna is a map. Unfortunately this otherwise excellent work is spoiled by the

REVIEWS. 67

absence of this key to the understanding of the district and the species distribution. The distinguishing generic and specific characteristics are all carefully tabulated from the descriptions given by Scudder in his great work on the "Butterflies of the Eastern United States" and thus much repetition is precluded. Every species is figured and in the text under each species the whole account is restricted to biological facts, under headings: - Occurrence, History, Seasons, Habits, Spring forms. Sequence of forms, Notes and Remarks and occasional references to Broods, Caterpillar, Chrysalis, Local Variation, etc. Some 60 pp. are devoted to summaries of the facts; Racial Forms, Faunal Limits and Relation, Species Permanent in District, Immigrant Species, Typical species of various habitats, Day and Seasonal occurrence of Butterflies, Succession of Butterflies, Pressure of Population, Effects of Storms, Butterfly Migration, etc. A mass of well digested matter and full of interest rather for the entomologist than for the mere collector. There are some notes on the Odours of Butterflies, and plts. 59-64 deal with the curious and so far unexplained effects shown on a sensitive photographic plate when the wings of butterflies are placed on them in complete darkness.-Hy.J.T.

THE BIOLOGY OF SPIDERS WITH Especial Reference to the Danish Fauna, by E. Nielson. Vols. I. II. 248 pp. XXXII plates (89 figs) + 724 pp. V. plts. (4 coloured), 465 figs. Messrs. Levin and Munksgard, Copenhagen 1932.—These two small quarto volumes are printed partly in English and partly in Danish. Vol. I wholly in English is a most interesting and full discussion of the Biology of these creatures, while Vol. II is the systematic portion and deals not only with species found in Denmark, but includes notes on species native of Sweden, the Tyrol and the Riesen-gebirge. Spiders are generally considered as outside the perview of the entomologist, but the biologies of spiders and insects are so closely interwoven that entomologists must often desire to gain a certain amount of knowledge of the former group. Although a number of figures of the creatures themselves is given, the bulk of the illustrations are of the snares, the retreats, cocoons, etc. with a few exhibiting special structures which have been evolved for functions which are specific rather than of general occurrence. The sections devoted to the "water spider," Argyroneta aquatica, the "garden" or "cross" spider, Epeira diademata, and Atypus affinis, the so-called "trap-door" spider of England, are most interesting and full. In fact the whole of the first volume is most attractive reading. The introductory portion is, perhaps, the most useful portion for a beginner dealing as it does with (1) Moulting; (2) Regeneration of limbs; (3) Sound producing organs; (4) Types of Webs; (5) Types of Snares; (6) Special Threads; (7) Uses of Claws; (8) Nests of spiders; (9) Copulation; (10) Egg-laying; (11) Cocoon; (12) Gossamer; and finally (13) The Spider as a Sky-pilot. A large number of references is given to each species both in the Text and in the List of Danish Spiders, a good Bibliography and two Indexes are also given. But one would like to have seen in the sections of Vol. I. reference to the sections of Vol. II. where more detailed information could be found without consulting the index of that volume. The get up of these volumes is everything that could be desired. It is rarely that one gets such a wealth of illustration as one finds in these two volumes.—Hy.J.T.

BITUARY.

J. J. Joicey.

We much regret to record the death of Mr. James J. Joicey from heart failure on March 10th at his residence, the Hill, Witley, Surrey.

He was 61 years of age.

From boyhood he was interested in Lepidoptera, but it was not until a few years before the war that his interest in Exotic Lepidoptera led him to build up the vast collection which he has left. His purchase of the Grose-Smith Collection in 1910 and of the Druce Collection in 1912, served at once to make his own Collection one of the largest private Collections in existence. Since 1914, Mr. Joicey's Collection has steadily grown in size and in scientific importance. It was developed by the purchase of other private Collections, among which the most notable were those of Trimen and Elwes. At the same time, Mr. Joicey sent the brothers Pratt to S. America and to New Guinea, and later, the late T. A. Barns to little-known parts of Africa. These collectors sent home an immense amount of material, a great deal of which was new to science.

In 1921, Mr. Joicey published the first part of the Bulletin of the Hill Museum, of which four volumes have been completed. In addition to this, the work carried out at the Museum formed the subject of 87 papers in other journals. Mr. Joicey was also responsible for the publication of Talbot's "Monograph of the genus Delias" of which however only five parts have been issued. A Catalogue of the Type specimens of Rhopalocera in the Collection has been prepared and will be published shortly. He made very large gifts of specimens to the B.M., including the entire material of a number of families. Recently he had arranged to concentrate on African Lepidoptera, and arrangements were being made to extend this fauna very considerably, whilst reducing many other groups.

Mr. Joicey was a fellow of the Entomological, Zoological, Linnean,

Royal Geographical and Royal Horticultural Societies.

[An interesting account of Mr. Joicey's gifts to the Natural History Museum appeared in the *Times* of March 16th.]

Richard South.

We much regret to announce the death of one whose name has been an oracle with all the budding lepidopterists of the last quarter of a century. Richard South died on March 28th, at the fine old age of 85. To the younger generation he was known as the author of that wonderful work on British Butterflies and Moths in 3 vols., a work that every older lepidopterist would have been only too glad to possess when he began his collecting career. To the older men he was known personally as an ever present member of the South London Entomological Society of which he had been a strong supporter during the whole of the active part of his life. He had been on the Council many times, had held the chair for two periods and shared in all the Society's activities until some twenty years ago. He had been a Fellow of the Entomological Society for many years and had served on the Council. A full Obituary of him was in the Times of March 31st.—Hy.J.T.

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Subscribers may have Lists of Duplicates and Desiderata inserted free of charge. They should be sent to Mr. Hy. J. Tunner, "Latemar," West Drive, Cheam.

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Desiderata.—Very numerous British Macro Lepidoptera.—J. W. Woolhouse, Hill House, Frances Street, Chesham, Bucks.

Desiderata.—Species of Dolerine and Nematine sawflies not in my collection; list sent.—R. C. L. Perkins, 4, Thurlestone Road, Newton Abbot.

Duplicates .- Albimacula*, sparganii*.

Desiderata. — Ova of D.oo. pupae of X. gilvago, D. caesia. A. J. Wightman, "Aurago," Bromfields, Pulborough, Sussex.

Exchanges.—Living Eggs of Catocala fraxini and sponsa, exchange for butterflies of British Isles.—C. Zacher' Erfurt, Weimar, Street 13, Germany.

Duplicates.—Pyralina*, Salicis, Ianthina*, Orbicularia*, Repandata in variety, Doubledayaria, Black rhomboidaria*, Black virgularia* and others.

Desiderata.—Hyale, Welsh aurinia. Polychloros, Tiphon Agathina, Lunigera, Lucernea, Neglecta, Diffinis, Populeti, Gothica v. gothicina, White Leporina, Tridens Putrescens. Littoralis, Typhae v. fraterna, Rurea v. Combusta, Gilvago, Fulvago v. flavescens, Liturata v. nigrofulvata. Harold B. Williams, Woodcote, 36, Manorgate Roud, Kingston Surrey.

Duplicates.—A large number of species of European and Palaearctic Rhopalocera and Heterocera.

Desiderata.—All British species especially those illustrating characteristics of an island fauna. Dr. Lor. Kolb, München 54, Dachauer-str. 409, Germany, and Franz Daniel, München, Bayer-str. 77, Germany.

MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W.7. 8 p.m. May 4th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. April 28th, May 12th.—Hon. Secretary, Stanley Edwards, Avenue House, The Avenue, Blackheath, S.E.3.

The London Natural History Society.—Meetings first four Tuesdays in the month at 6.30 p.m. at the London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, W.C.1. Visitors admitted by ticket which may be obtained through Members, or from the Hon. Sec. A. B. Hornblower, 91, Queen's Road, Buckhurst Hill, Essex.

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CONTENTS

Lepidoptera in and around the Ran-dan Woods, Bromsgrove, P. S. Smit	h 69		
M. Pacifica, a species hitherto confused with M. britomartis, Dr. R. Verit	y 70		
Aigle and the Rhone Valley, Switzerland, May, 1931, Lt. E. B. Ashby F.E.S	70		
The Spring of 1931 in Kabylia, Miss L. M. Fison	. 74		
Notes on Collecting,—Northern insects in C. Wicklow, A. W. Stelfox;			
A Note, Rev. G. Wheeler, M.A. F.E.S	. 76		
CURRENT NOTES	. 78		
REVIEW.—Medical Entomology, Hy.J.T	. 80		
SUPPLEMENT.—British Noctuae, H. J. Turner, F.E.S., F.R.H.S. (2)	25)-(232)		

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Lepidoptera observed in and around the Ran-dan Woods, Nr. Bromsgrove, 1927-1931.

By P. SIVITER SMITH.

The following list is an attempt to work out the insects occurring in the Ran-dan Woods, consisting of Oak (chiefly), Birch, with Ash and Poplar in very small numbers. The soil is sandy and very light. Honeysuckle is common, and there are odd little patches of Larch. I was at Bromsgrove School during this period 1927-1931, and as all my observations are made during the term, it will be grasped how inadequate the time allowed was for a thorough investigation. This accounts for the almost complete absence of the common Noctuidae and other nightfliers which almost certainly occur in large numbers. The locality is, I imagine, a very good one.

RHOPALOCERA.—Pieris brassicae, generally common in a large central clearing; less common elsewhere. P. rapae, common. P. napi, very common, especially on the south side of the woods. Euchloë cardamines, common, females scarce. [Leptosia sinapis, an intensive search was made for this elusive species, which used to occur here, but without result.] Aglais articae, common. Vanessa io, common on the outskirts of the wood facing east. Pararge megera, occurs in small numbers. Epinephele jurtina, abundant. Coenonympha pamphilus, very common. Rumicia (Chrusophanus) phlaeas, common. Polyonmatus icarus.

common.

In the Report of the Bromsgrove School Natural History Society (September, 1930, to July, 1931) occur the following species, listed as occurring in these woods: Dryas (Argynnis) paphia, "1 specimen in 1931." Argynnis adippe, "probably of regular occurrence." A species whose presence has not been verified and which therefore should not be in the list. I doubt if it occurs there. A. aglaia is not listed. Brenthis euphrosyne, "common in some years." In the text of the Report it says that in the woods "several Small Pearl-bordered Fritillaries (A. selene) were seen," but A. selene is not in the district list so there is a mistake somewhere. Probably B. euphrosyne is the species meant in both cases. Parage aegeria var. eyerides, "Wood Ringlets were abundant in the Ran-dans in July." I am not clear if this is P. egerides or Aphantopus hyperantus, the Ringlet. In the list for the Ran-dans, P. eyerides is not represented, while A. hyperantus is "common." Lycaenopsis argiolus, "not common." I have searched for this species as hard as I have for L. sinapis but have not turned it up. I don't know of any specimens being caught lately. Adopaea flava (thaumas), "fairly common." Augiades sylvanus, "fairly common."

HETEROCERA.—Polyploca flavicornis, I took one specimen, March 26th, 1931, just emerged. I imagine the species is quite common. Cosmotriche potatoria, larvae of course common. Spilosoma menthastri, larvae common. Arctia caja, larvae more abundant than I have ever met them in one locality. Taeniocampa cruda, I have found the wings of this species floating in ditches. Brephos parthenias, this species is most abundant, and flies around trees of all species all over the woods. I have not seen B. notha; there is no Aspen in the woods that I have seen. Ortholitha chenopodiata (limitata), common everywhere. Odezia

atrata, occurs in one field about 1½ miles from the wood, on the east side, but it is not common there. Eulype hastata, frequent but by no means common. Euphyia (Camptogramma) bilineata, common, but Anticlea derivata (nigrofasciaria), not uncommon; no nice forms. generally on Pine trees. Eupithecia pusillata, this is probably the most interesting insect that has been recorded in this district. South (Moths Brit. Isles. Vol. II.) says, "very local" and gives as localities Kent, Surrey, Hants, Devon, Wilts, and Suffolk. Meyrick (Brit. Lep. 1928) gives "Kent to Devon and Wilts, Derby, local." Entemologist, 1918, p. 187, E. pusillata is recorded from Cambridgeshire. I have one specimen taken on May 25th, 1931, resting on a Pine trunk on the outskirts of the wood. This would appear to be the first record of this insect in Worcestershire. Col. C. Donovan kindly confirmed the identification of the insect from a fine series he has taken in the Cotswolds. Cabera pusaria, not uncommon. Selenia bilunaria, a few specimens seen in 1931. Erannis (Hybernia) leucophaearia, common on oak trunks, ab. merularia in 1931 was about 18%, and ab. marmorinaria also about 18% of the whole number seen. Erannis (Hybernia) marginaria, I found one female on a small oak bush in Phigalia pedaria, a few, resting on tree trunks. (Tephrosia) bistortata (spring form), one in 1930. Lozogramma chlorosata (petraria), abundant in the bracken.

The following species are mentioned in the School Report, and are insects I have not recorded in that list. Phalera bucephala, "not uncommon." Tephrosia bistortata, "1 specimen 1931." Date not

given.

This list is, of course, absurdly small, but on the average I probably would not have visited the wood more than six times a year, and most of these visits would be in the spring which did not help the number of species observed. Possibly others have notes from this locality which would be of interest, as I have seen no references to it before except by the Rev. F. O. Morris.

Melitaea pacifica, a species hitherto confused with M. britomartis form plotina, Bremer.

By ROGER VERITY, M.D.

On closing the series of papers on the Melitaea, I have published during the last few years in this Journal, I must make an addition to what I have said about plotina, Bremer, in Vol. XLII., page 110. On the strength of Bremer's original figure I remarked that this name applied perfectly to the Asiatic form of britomartis, Assm., which somewhat recalls, in some respects, the look of M. diamina, Lang = dictynna, Esp., so that he was quite right in describing it as a variety of the former and in saying that, although it had a very distinct aspect, it was connected with it by transitions; in his description he does not mention the upperside, but it is to be observed that in the figure the whole of the black pattern is remarkably thick, so that, for instance, the inner one of the two premarginal bands of both forewing and hindwing is very broad, and the whole basal half of the hindwing is black, with only a few very small fulvous spaces; the wings are also elongated and rather pointed. All this corresponds exactly to my

diamina-like specimens of britomartis from high altitudes in the Altai and from Mondy in the Sajan Mts. 2600m. Rühl describes all these features in his long description of plotina, page 414. Staudinger in the Mém. Romanoff, VI., p. 187, began to mix things up; he states that Bremer figures a specimen with a very broad dark pattern, whereas all the ones received from both eastern and western Siberia by himself had a thin one. Now, since writing my paper of 1930, I have received from Bang-Haas some speimens which have cleared up the situation. They are obviously what Staudinger called plotina, but they are distinctly different, notably on the upperside, from Bremer's and there is no sign of transition to the latter in any of them; they are frailer in build, the wings are less elongated, the fringes are shorter and less broadly white, the whole pattern on the upperside is very much thinner so that the inner premarginal band is even partly effaced in one or two of my specimens and the base of the hindwing is fulvous down to the root, with separate bands and streaks across it; there is a remarkable contrast with the underside black pattern, which, in some specimens, is thick on both the forewing and the hindwing and would correspond quite well, in a general way, to Bremer's description. Evidently this resemblance has been the cause of the confusion made by Staudinger and which has spread with his specimens. It is unfortunate, but there can be no doubt that a confusion has been made. The two insects are quite distinct and the fact there is no approach of one to the other, as stated by Staudinger and as shown by my specimens, in a genus such as this one, makes it quite clear. It is possible that Bremer's specimens from lower Ussuria belonged to the other species, but, anyhow, the one he figures must be taken as the "type" of plotina and this name used accordingly; it was, presumably, one of those collected by Radd in the Bureia Mts. and it was in this set be noticed the transition to the aspect of the European britomartis, which he mentions in his original description and which thus settles, together with the figure, the insect his name must apply to. As to the other, described above, Staudinger's misuse of plotina has left it, to this day, without a name and I propose giving it that of **pacifica**, owing to its restricted eastern area, as compared with those of the other species, which stretch across the Palaearctic region. I select as "Holotype" one of my male specimens of July from Troiz Kossowsk, 800m., on the Tshikoi river, in the south-western Trans Baikal province; others from Sutshanski Rudnik, near Vladivostok, are very similar to them, but larger. The former are smaller than most plotina and agree very exactly, in every respect, with Seitz's figure of plotina on pl. 67c; two have the underside quite as intensely suffused with ochre-yellow as that figure, whereas this never occurs in the true plotina, as I remarked it in 1930, when I thought that tone of colour could only be a mistake in the plate; other pacifica have no signs of it and, as a matter of fact, have spaces of a very pure silvery white; these, whether white or yellow, are always separated into small roundish spots with a thick black edge, to a degree not seen in true plotina; also the russet spotting of the hindwing is more restricted than in the latter and replaced, in some cases, by a more yellow colour.

It seems highly probable that the single specimen from Ussuria, which Suschkin says he possessed under the name of plotina and whose genitalia are, according to his figure and description, extremely similar

to those of niphona, Butler, was a pacifica. If the genitalia of the latter actually are of this kind, its position would evidently be between britomartis and niphona and it would confirm my view that athalia and niphona have sprung, as parallel branches, from a common ancestor. As soon as I can, I will have my own specimens dissected in this connection. The large Vladivostok race of pacifica might be called ussuriae.

Aigle and the Rhone Valley, Switzerland, in May, 1931.

By LIEUT. E. B. ASHBY, F.E.S., F.Z.S.

(Concluded from page 58.)

May 18th.—After heavy rain in the night the only possible ground was Charpigny, which dries quicker than the low lying meadows around. On the ascent through the property from the St. Triphon station side the males and females of the bee Andrena hattorfiana, Fab., were flying numerously around a seat on the right hand side of the twisting path. The Charpigny property now belongs to a Frenchman, who lives in Paris. To-day I met his brother who manages the property for him, and we had a very pleasant chat. I could only box a number of Polyommatus semiargus, males, and P. hylas, which latter were emerging this morning, and were found at the damp puddles in the Charpigny entrance road, near St. Triphon station. The coleoptera Blaps mucronata, Latr.; Cryptocephalus aureolus, Suf.; the Hymenoptera Ammophila sabulosa; Proanthidium laterale=4-lobum, Per.; Diprion polytomus, Hartig.; the Rhyncola Cornutus centrotus, Lygaeus saxatalis, Stenodema laevigatum, L.; etc., were noted.

After midday I went along to the banks of the river Gryonne to complete my good series of P. thersites which were all resting on the heads of Onobrychis sativa. I also took the beetle Meloë brevicollis, Panz., \mathcal{F} ; and Melolontha vulgaris \mathcal{F} ; and several specimens of Larinus sternus, Schaller; and the moth, so distinctive and so often

overlooked, Thyris fenestrella, Scop.

May 19th.—To Vernayaz for the walk to Martigny, but a poor day taking only units of P. podalirius; C. dorilis; S. orion; and a few M. cinxia; the Rhyncotid Rhaphigaster sagittifera; the Hymenoptera Chalicodoma muraria, F.; Bombus sylvarum; Arge enodis; Tenthredella temula, Scop.; and the Coleoptera Silpha thoracica, L.; Cryptocephalus

aureolus, Suf.; and the Neuropteron Sialis fuliginosa.

What is much worse, they are making a new road along under the cliffs, from Martigny up to Salvan, which will destroy most of this well known famous walk "under the cliffs" from Vernayaz to Martigny. I went in peril of my life to-day as they were blasting high up most of the way and frequently many rocks and stones were falling. The small piece left of the old walk is from the Vernayaz end. I did not reach quite as far as Martigny, as it was quite useless and I had to walk part of the way on very marshy ground.

May 20th.—Pouring with rain all day; frogs for the entree at dinner; and at night the moth Euxoa cinerea, Schiff., flew into my

bedroom

May 21th.—To the St. Triphon marshes, and along the bed of the canal which runs parallel to but a little distance south of, the railway

line. Anthocharis simplonia var. flavidior, Wh., are fresh out to-day and settle frequently along the canal bed on the yellow flowers of apparently a crucifer, which is abundant right along the canal bed on both sides.

M. parthenie and Erebia medusa are now more plentiful in the marshy meadows, and I took one 3 ab. procopiani, Hormuzaki, of the latter. A. sylvanus was out quite fresh, and I took a fine Hesperia malvae var. taras in the marshy meadows, with the Hymenoptera Ophion luteus, L., Tenthredopsis stigma, the beautiful Andrena hessae, Panz., prominent on blossoms all along the canal bed; Anoplius viaticus, F. (= Pompilus viaticus, auctorum); also the Dipteron Chrysotoxum festivum, L.

May 22nd.—Along the canal bed south of the railway from Aigle towards St. Triphon. I completed my series of A. simplonia var. flavidior, which includes 3 fresh females; I completed also my series of E. medusa and M. parthenie. The Neuropteron Sialis fuliginosa was common along the canal bed; 2 more Andrena hessae, Panz., and

Psammochares fuscus, L., amongst the Hymenoptera.

To Charpigny for an hour when I found the moth Z. achilleae in full emergence; the Coleopteron Silpha obscura, L.; the Rhyncota Eurydema oleraceum, L., form annulatum, Fall.; the Neuropteron

Rhyacophila abttindens, McL. Today was extremely hot.

May 23rd.—To Branson. A few S. orion, var. and ab. nigra, Gerhard, were taken on the rocks between the Rhone Bridge and Branson Village. I had the pleasure of meeting, I think, Mr. C. W. Wyatt in the middle of Branson village. I went on and up further taking half a dozen Everes argiades ab. polysperchon, Brgstr., 3 3 s and 3 \(\mathbf{c}\) s. P. apollo and A. crataeyi, were on the wing in units, and one specimen of H. malvae, ab. taras, Mg. I took also the Hymenoptera

Allantus bifasciatus, Müll. and Sphecodes gibbus.

May 24th.—To St. Triphon Village station by the electric tramway; and then down towards Charpigny; then again down to and across the bridge over the railway line proper, and then down to the canal bed. Susa is hot in July, but that canal bed worked twice over to-day nearly boiled me. I took the largest 3 of P. machaon I have ever taken and two more A. simplonia var. flavidior, Wh. one a 3; M. dictynna was commencing to emerge and the moths Diacrisia sanio and Tanagra atrata, L., along the canal bed. Also the Hymenoptera Allantus bifasciatus, Mull.; Andrena hessae, Panz.; and Tenthredella flavicornis, Fabr. The Rhyncotid Cercopis sanguinolenta; and the Coleopteron Cryptocephalus aureolus, Suf.; and a female of the moth Aphomia sociella, L.

May 25th.—To-day to Martigny, whence by funicular to Marecottes on the Martigny-Chatelard line. I went too high for this date this spring only getting two fine S. arion var. and ab. nigra at Marecottes, and afterwards descending by road the 15 kilometers down to Vernayaz I took units of Glaucopsyche cyllarus; M. cinxia; Callophrys rubi; L. argiolus; and M. dictynna in the marshes at Vernayaz; with one P. podalirius on the road just by Vernayaz station. I feel sure I saw I'. mnemosyne on the way down, but it was unreachable. One specimen of the Hymenopteron Chrysis ignita, and one specimen of the beetle

Dermestes lardarius, L., were taken.

May 26th.—At Aigle to-day a single specimen of the Hymenopteron Odynerus parietum.

May 27th.—To Caux via Territet and Glion. My best thanks to the Rev. G. Wheeler who directed me so well that I walked into the Loweia amphidamas spot. I was able to take 12 specimens, about 6 of each sex; and discarded two others as they were chipped; and in view of the late spring I think I was very fortunate. On the way back to Caux some nice Cupido minimus were boxed, but I was unable to take a selection of the Alpine moths, as a sudden thunderstorm broke.

May 28th.—To Villeneuve station to walk up the Val Tinière. I apparently missed the reservoirs mentioned in Mr. John Alderson's article in Ent. Record, Vol. XXII., No. 9, page 207, unless they have long since gone, but I followed the directions given by him and made straight, a long climb, for the place where the road crosses the stream over a wooden bridge, and taking a footpath to the left, which led to some favourable collecting, a large flowery field, on a steep hillside; here Erebia medusa were in great quantity; and M. parthenie in fair numbers; H. dorilis, Powellia sertorius (sao) and some H. malvoides* but I could not find Aricia eumedon, nor H. hippothoë, though I was told yesterday on the railway between Caux and Glion that "Large Coppers" had been seen in the near district. I also took the Hymenopteron Ammophila hirsuta, Scop. and the Neuroptera Chrysopa perla, L., and a specimen of a Nemoura species? After descending a little by the main road, and taking a path to the right leading to a small chalet-restaurant Folquier-Sequier, I succeeded in getting one fresh specimen of Aricia eumedon, the possibility of getting any others being dispelled by the advent of a thunderstorm, which had the after effects of attracting the Lycaenid blues of the district to the puddles and wet mud of the main road down to Villeneuve station. Two specimens to-day of the interesting Dipteron Coelomyia ferruginia, Scop., more of which are wanted for the South Kensington Natural History Museum. Colias hyale and Pieris napi var bryoniae males were frequently noticeable during the day, and one or two C. palaemon. I also took the Coleopteron Mylabris variabilis, Pall.

May 29th.—This morning I took the Coleopteron Trichius fasciatus, L., near the Grand Hotel, at Aigle. Beating for larvae in the same spot was useless. I left Aigle for London after dinner, at which I had the pleasure to meet Mr. Symmons, who had just arrived at the Hotel to collect in the district. Before concluding I must again thank those many Naturalists who have helped me to identify the more difficult

species mentioned in this article.

The Spring of 1931 in Kabylia.

By Miss L. M. FISON.

There is perhaps nothing more beautiful than the early spring in North Africa, before the extreme heat of summer sets in, and after the often severe winter has done its worst, for contrary to what is popularly believed of sunny Africa, December, January, and February are often bitterly cold, and heavy falls of snow and torrential gales of hail, rain and wind are experienced. In Kabylia we have had falls of snow of about 3 feet deep.

^{*} H. malvoides? So far only H. malvae has been found up to S. Maurice and is certainly very common in the Tinière Valley.—G.W.

There is a great charm in my mind in early collecting in Kabylia, for although there is no great profusion of insects, yet everything is fresh and there is the daily interest of seeing fresh species emerge, and the joy of feeling that one is escaping at least two months cold of

England or of North and Central Europe.

During March, April and May the Djurjura Mountains are at their best, and the Genista, Lavender, Cistus and Asphodel covered slopes, the young green corn, etc., produce a brave show of brightness and colour. Long days out in the open air are a glorious delight in the brilliant sunshine, but oh! the heat later in July, August and September, during which months everything is parched and burnt up. Then indeed it may be said of North Africa that it is a thirsty land where no water is, where cattle, sheep and flocks die often in thousands for lack of sustenance, and where the sirocco blows for days on end, withering all before it in its burning blast.

For the last 12 years it has been my privilege and joy to carry the Gospel to the Kabyle tribes who inhabit little primitive villages perched amongst these mountains, and it is during the long walks or rides amongst these neglected tribes that we are learning more each year of

the secrets of the butterfly fauna common to this range.

Our headquarters is Michelet, a mountain village and chef d'arron dissement de la Commune Mixte di Djurjura situated at a height of 3,000 feet above sea level.

In the plain of the Sebaou, and Mitidja, hundreds of feet lower down, and away in other low-lying regions on the Hauts Plateaux, Tell, and great Sahara, species emerge certainly earlier than those at Michelet, indeed certain species fly all the winter in parts of S. Algeria. We shall, however, write merely of an experience in the Djurjura

range.

Our earliest entry for 1931 is that of *Pyrameis atalanta* (an undoubted case of hibernation), found near the Kabyle village of Aguemoun Izem, on January 21st, during a fine spell between falls of snow and sleet. Frequently at Michelet the snow is so deep that we are without communication of any sort for days. However, lately a service of a snow-tractor has been established, so we trust the Government Road at least will now be kept open during the snow.

We have no further entry between January 21st and March 4th; but on the latter date Eugonia polychloros (hibernated specimens) was common around the "Chêne-Zéen" trees (kind of Algerian oak) near

the village of Tafraout. We captured 3 specimens.

On March 5th near Taka we again found E. polychloros and also saw 2 hibernated "Brimstones," Gonepteryx rhanni. On the 11th near Thaurirti Euchloë eupheno began to emerge, also Pieris brassicae and P. rapae.

From March 11th-24th we spent at a little sea-side port called Port Gueydon, and at Les Aggribbes in the mountains the other side

of the Valley of the Sebaou towards the coast.

March 18th.—Between Tizi-Ouzou and Aggribbes we observed the following species flying in the Sebaou Valley, Pieris brassicae, P. rapae, Gonepteryx rhamni, Anthocharis belia (ausonia) and Euchloë eupheno. Whilst at Aggribbes we caught several A. belia (ausonia) and Anthocharis belemia.

March 19th .- Pyrameis cardui appeared, also Thestor ballus.

Whilst at Port Gueydon we discovered a sheltered ravine which proved to be a good butterfly corner, and here we saw or captured Euchloë eupheno, Gonepteryx rhamni, Pararge aegeria, Colias croceus (edusa), P. brassicae, Thestor ballus, P. rapae, and Zerynthia (Thais) rumina. On a beautiful piece of the corniche road by the side of the Mediterranean between Bizarga and Port Gueydon we saw or took Pararge aegeria, G. rhamni, P. brassicae, P. rapae, E. eupheno, T. batlus and A. belia (ausonia).

March 20th.—At Aggribbes we took 2 Z. rumina, T. ballus and

A. belia (ausonia).

March 30th.—After our return to Michelet we found the following species had emerged near the Kabyle village of Tril Igonlmimen.—P. brassicae, P. rapae, A. belia (ausonia), E. eupheno, T. ballus, G. rhamni, G. cleopatra and Eugonia polychloros.

April 2nd.—Near Agoni-Gsaad produced Callophrys rubi and C. avis (?), Pyrameis cardui, E. polychloros, P. brassicae, P. rapae and Euchloë eupheno 3 and 9; also Polyommatus icarus, Powellia sertorius

(sao) and T. ballus.

April 3rd. -We took Anthocharis belemia for the first time near

Michelet.

On Easter Monday we discovered a good butterfly corner near the village of Agoni-Taslent and had a good day. We captured 3 Papilio podalirius, Rumicia phlaeas, Pieris napi very fine and fresh, P. rapae, P. brassicae, T. ballus, P. icarus, P. sertorius (sao), Eugonia polychloros, E. eupheno particularly common and also A. belia (ausonia). We also came across Libythea celtis, and this is the only locality where I have as yet seen it in Kabylia. There are a good many "Micocoulier" (Celtis) trees in the district.

(To be concluded.)

MOTES ON COLLECTING, etc.

NORTHERN INSECTS IN CO. WICKLOW, IRELAND.—In the April number of this Journal, p. 63, Canon Foster refers to the presence of northern insects in Co. Wicklow and quotes from a somewhat hastily written letter of mine. He had expressed surprise that he had captured in Wicklow a micro-lepidopteron not previously recorded as British except from Scotland, but knowing this district this did not surprise Although situated on the eastern seaboard of Ireland, Wicklow has in its fauna and flora many species characteristic of the western counties of Kerry, Mayo and Donegal, some of which have southern and some northern affinites. When I wrote Canon Foster I had in my mind some of the latter of which I will give two good examples. Both are ichneumon flies and possibly parasitic on lepidoptera, though so far as I am aware their hosts have not yet been ascertained. Cryptopimpla anomala, Holgrn., is reported by Morley (Brit. Ichn. III. 184) from near Currie in Midlothian, Scotland, and doubtfully by Bridgman from "Wickham" (los. cit.). This species I have found in an oak wood, with much hazel, holly, etc., in the Gold Mines Valley, Co. Wicklow, where it appears to be not uncommon towards the end of March. Both sexes have occurred to me as early as the 25th of that month. This locality is one of the mildest in Wicklow and not

more than a hundred feet above sea level.

Farther north, in Co. Dublin, I have taken males at 1,000 to 1,200 feet alt. in Glenasmole on May 25th. Dr. A. Roman of Stockholm seems to regard this as a species typical of the northern parts of Sweden, and on receipt of specimens expressed his surprise at my getting it so far south, adding that "Thomson does not mention this species, evidently because he never met with it, he living in the southernmost part of Sweden, and C. anomala not going so far south."

The second species I wish to refer to is Lissonota maydalenae, Pfankuch of which I took a single female on the elevated plateau near the source of the R. Liffey, at 1,700 feet alt., on June 7th, 1929. This was kindly identified for me by Dr. Roman, to whom I had sent it as possibly a new species. So far as I know it has not previously been reported from the British Isles. When returning my specimen, Dr. Roman remarked:—"Your first specimen astonished me, for I recognised in it a species from my own country. It is a regular spring species which I in 1924 (Arkiv. för Zoologi, Band 17a, No. 4, p. 24, 1924), described as L. vernalis, but before my paper appeared in print I discovered that Pfankuch had already (Krancher's Ent. Jahr., 1921, p. 125) described it from his region as L. magdalenae." In passing I may mention that on the central plateau of Wicklow the northern water-beetle Agabus arcticus occurs in extraordinary abundance in the shallow "pans" which stud the moor.

I hope that my reason for not being surprised at Canon Foster's capture of *Penthina staintoniana* in Wicklow will now be more obvious.

-A. W. Stelfox, (M.R.I.A.), 14, Clareville Road, Dublin.

A Note.—The following two footnotes should have appeared in the last number on pages 58 and 59 respectively with the article on Algerian Butterflies by Miss L. M. Fison.

(1) "Argynnis adippe." "Probably subspecies auresiana."

"As I pointed out at a meeting of the Entomological Society of London some years ago when I exhibited the first specimen (I believe) of A. auresiana seen in England, this is not a form of cyclippe = adippe, the andreconia being quite different and is much more nearly related to A. niobe."—G. WHEELER.

(2) " Powellia therapne."

"Is this P. therapne or P. sertorius (sao)? The former is usually supposed to be confined to Corsica and Sardinia. The latter mention of P. sertorius (sao) would however seem to point to both species occurring in Algeria."—G. WHEELER.

^{*} It may be well to point out that Schmiedeknecht's description of the β of his anomala (Opuscula Ichn. p. 1251) is not taken from the β of this species, which has no yellow markings as there described by him. Dr. Roman agrees and tells me that the Wicklow β is identical with one in the Swedish National Museum.

WURRENT NOTES AND SHORT NOTICES.

Mr. W. G. Sheldon has again asked us to call attention to the "Wicken Fen Fund" of which he is Treasurer. May we remind subscribers that now is the time to renew their annual contribution. No doubt they have all had a copy of the Ann. Report of the Fund so that they are aware of the work that has to be done annually, and which needs keeping up to preserve the wonderful local fauna and flora of the district from the destruction of neglect and depredation. We hope that all who have helped in the past will continue to do so, despite the devastating attacks that the activities of world financiers

have caused upon pockets of late.

Our colleague Dr. Burr has made use of his intimate knowledge of the Russian language to translate the MS. of P. S. Nazaroff, Hunted through Central Asia. The author relates his adventures among the Sarts and Kirghiz for two years as a geologist and naturalist, his forged credentials holding him in good stead until he could escape across the Tian Shan Mts. into Kashgar where he lived for four more years before passing on into Thibet. The book not only relates the incidents of his adventure as a fugitive, but contains interesting descriptions of the countries visited, the people in whose encampments he often lived, the plants and animals, and the results of his keenness for scientific research such as his discovery of tin ore in Central Asia. Dr. Burr's translation well reproduces the vigour and humour of the author; the book has a map which aid no book should be without. The price, too, is low.

We much regret to report the death of another young and able entomologist, J. C. Robbins, F.E.S., of the staff of the Imperial Bureau of Entomology. Like the late Dr. Withycombe, he had the keenness, the skill and the basic acquirements which would, in the

future, have led him to eminence.

The Fifth International Congress of Entomology takes place in July when the Centenary of the founding of the Société Entomologique de France takes place. The Itinerary already arranged is a long one embracing the period from Friday, July 15th to Sunday, July 31st. The French Government has made a considerable grant towards the Congress expenses and there will be a 50% reduction of railway fares during the period of the meeting for all those taking part. Papers will be read each day from Monday, July 18th till Saturday, July 23rd, and various entomological questions of international concern will be We are wondering what will be done over Nomenclature. Our British National Committee is the only active one, if not the only one existing, and of that we have heard nothing of its activity since the last Congress. Each day Excursions will take place at very reasonable costs; two different itineries for Paris, Forest of Fontainebleau, Versailles, Chantilly, a visit to the tomb of Latreille, to the Museum of Natural History, etc. At the finish of the Congress there will be an organised excursion to the Pyrenees, in course of which visits will be paid to Lourdes, Gavarnie, San Sauveur, Luchon Lac d'Oo, Tarascon, Carcassonne, Toulouse, etc., largely by autocar. The permanent Secretary of the Congress is Dr. Karl Jordan of Tring, and Dr. H. Eltringham is one of the executive Committee. travelling arrangements and hotel accommodation is in the hands of

Messrs. Thos. Cook & Son. The meeting should prove a most interesting and enjoyable one to all those who take part; we hope that every success will attend it.

Nos. 1-3, Vol. IV. Revista Soc. Ent. Argentina, are to hand and contain a long and complete Memoir, "The Lepidoptera of the Argentine. Family Nymphalidae," by our friend and correspondent Capt. K. J. Hayward, F.Z.S., F.E.S., F.R.G.S. After some five or six years of collecting in various areas of the country, the author has put his notes and observations together, compared his results with all the chief collections, public and private, in the state, and written this admirable contribution to our science. It is comprised in about 200 quarto pages and 21 black and white plates, with a few text figures. The life histories as far as known are given with descriptions, habitats and the principal references. Subspecies and forms are dealt with, the newly described being also given in English. The author has ably used his long experience of entomological matters in the Eastern Hemisphere to bring the Argentine material up to date not only for the use of the scientist but also for the beginner. Introductory matter gives a map showing the relative positions of the various provinces, the terms as the author uses them, the limits of venation, what he understands as subspecies, form, aberration, etc., a list of the species in their systematic grouping. At the end is a list of foodplants of the Nymphalids, the legends of the plates, a good bibliography of works dealing with the group as found in the Argentine and an Index. We must congratulate the author on the success of his work and compliment Messrs. Breyer, the two great patrons of natural history especially entomology in the state, for the great assistance they have rendered Capt. Hayward in every way so that this admirable piece of work could be accomplished.

In the Int. Ent. Zeit. for December 22nd, there is a summary of what is known of the Palluperina nickerlii forms (of which our British guenéei is one). There is a view of the ground on which the species is taken at Halle, a figure of the egg, one of the position of the batch when laid on a stem of grass, and figures of the valves of the genitalia. On the accompanying plate there are 17 good figures of representatives from Halle (dark generally), from Meissen (lighter with conspicuous reniform), from Eschwege (generally still lighter), and from Lancashire (the very light form guenéei). This is a very useful article,

but one would like to have seen the French forms included.

The illustrated supplement to Lambillionea for December contains figures of 8 aberrations of Melitaea aurinia and 2 of Aglais urticae. This completes another set of 12 plates, year 1931. These illustrations will be found most useful in illumining the descriptions of the many newly described forms to commonly occurring species by the contributors to this most useful periodical.

In the January number of Lambillionea is commenced a new set of plates of aberrations, the present one containing 8 figures of Chrysophanus (Heodes) dispar including race batavus, subspecies rutilus (with gen. vern. burdigalensis and gen. est. aestivalis). The text deals in detail with the various races and forms of this species by Dr.

Mezger.

In his Annual Address to the Entomological Society of London, the President, Dr. Eltringham, dealt with Entomology (1) as a subject

of great interest for itself, and (2) as something having a bearing on

human progress.

In the recently issued Memories Soc. Ent. Italiana, X. 1, Signor Rocci deals intensively with the forms of variation exhibited in Melitaea athalia and illustrates his remarks with 2 plates of 40 figures. He makes two types of forms. A: examples of small size, always less than B, but variable, and in two diverse generations each in three recognisable forms. B: examples of larger size, always larger than A, some larger still. The former group comparable to aurelia and dictynna, the latter comparable to athalia true and helvetica.

May we again remind our readers to look out for early spring immigrants now that there is a break in the cold drought spell which

has lasted so phenomenally long.

The recently received Vol. LXXXI. pts. 1-4, Verh. Zoo. Bot. Gesell. Wien. has an important article "Critical and Synonymic Notes on Diptera" by F. Hendel. There are notes by M. Kitt on the "Lepidoptera of the Oeztale," and another article on the material taken during a trip to Algeria with a long list of the captures, some 300 species of Macro-lepidoptera. F. Preissecker also contributed an interesting account of the Lepidoptera occurring in Lower Austria, particularly referring to the most notable micro-lepidoptera.

REVIEWS AND NOTICES OF BOOKS.

Medical Entomology.—A Survey of Insects and Allied Forms which affect the Health of Man and Animals. By W. A. Riley, Ph.D., Sc.D., and O. A. Johannsen, Ph.D. McGraw-Hill Publishing Co. Ltd., pp. xii.+476, figs. 184. Large 8vo., 1932.—This is really a revision of a book published some years ago, now re-arranged, enlarged and brought up to date. It is not a record of original investigation but a compilation and classification of all that is known of the Relation of Insects to Man. After two or three short introductory chapters containing a few historical facts on transmission of disease. the ways in which the health of man can be affected (1) by poison, (2) by parasites, (3) by transmission of disease, and the classes of the Arthropoda, the following chapters deal with the attacks by Arachnida. Ticks, Myriapods, etc. An introduction to the metamorphoses of Hexapoda (Insects) and their external and internal anatomy, upon which the remainder of the information relies, follows. The next thirteen or fourteen chapters deal with the various orders of Insects, nine chapters, more than half the volume, discuss fully the relations of the Diptera to Man. Most of the illustrations are taken from well known and reliable sources and are adequate for their purpose. most valuable addition is given in the exhaustive Bibliography of 26 pages containing quite 600 references. The book should prove of outstanding use to students of medical practice, health committees, and all interested in the well-being of man and animals. The printers and publishers have done their part admirably. Every library should hold a copy not only for the information it contains but for the wonderful list of references.—Hy.J.T.

All MS. and EDITORIAL MATTER should be sent and all PROOFS returned to Hy. J. TURNER, "Latemar," West Drive, Cheam.

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EXCHANGES.

Subscribers may have Lists of Duplicates and Desiderata inserted free of charge. They should be sent to Mr. Hy. J. TURNER, "Latemar," West Drive, Cheam.

Duplicates.—S. Andrenaeformis, Bred 1928, well set on black pins, with data.

Desiderata.—Very numerous British Macro Lepidoptera.—J. W. Woolhouse, Hill House, Frances Street, Chesham, Bucks.

Desiderata .- Species of Dolerine and Nematine sawfiles not in my collection; list sent .- R. C. L. Perkins, 4, Thurlestone Road, Newton Abbot.

Duplicates .- Albimacula*, sparganii*.

Desiderata. - Ova of D.oo. pupae of X. gilvago, D. caesia. A. J. Wightman, "Aurago," Bromfields, Pulborough, Sussex.

Exchanges .- Living Eggs of Catocala fraxini and sponsa, exchange for butterflies of British Isles. - C. Zacher' Erfurt, Weimar, Street 13, Germany.

Duplicates.—Pyralina*, Salicis, Ianthina*, Orbicularia*, Repandata in variety, Doubledayaria, Black rhomboidaria*, Black virgularia* and others.

Desiderata,-Hyale, Welsh aurinia, Polychloros, Tiphon Agathina, Lunigera, Lucernea, Neglecta, Diffinis, Populeti, Gothica v. gothicina, White Leporina, Tridens Putrescens. Littoralis, Typhae v. fraterna, Rurea v. Combusta, Gilvago, Fulvago v. flavescens, Liturata v. nigrofulvata. Harold B. Williams, Woodcote, 36, Manorgate Road, Kingston Surrey.

Duplicates.—A large number of species of European and Palaearctic Rhopalocera

Desiderata.—All British species especially those illustrating characteristics of an island fauna. Dr. Lor. Kolb, München 54, Dachauer-str. 409, Germany, and Franz Daniel, München, Bayer-str. 77, Germany.

MEETINGS OF SOCIETIES.

Entomological Society of London.-41, Queen's Gate, South Kensington, S.W. 7. 8 p.m. May 4th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. April 28th, May 12th.—Hon. Secretary, S. N. A. Jacobs, "Ditchling," Hayes Lane, Bromley, Kent.

The London Natural History Society, -- Meetings first four Tuesdays in the month at 6.30 p.m. at the London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, W.C.1. Visitors admitted by ticket which may be obtained through Members, or from the Hon. Sec. A. B. Hornblower, 91, Queen's Road, Buckhurst Hill, Essex.

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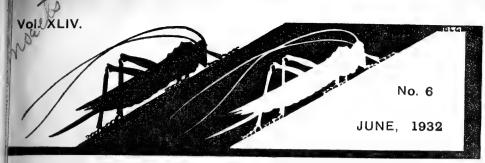
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CONTENTS

Lepidoptera at Dieulefit, April 1930 and 1931, Wm. Fassnidge, M. A List of Lepidoptera, Bromsgrove, 1927-1931, P. Siviter-Smith Parasitic Hymenoptera found with Ants, H. Donisthorpe, F.Z.S., F.E.S. Mosley's Illustrations of Varieties of Brit. Lepidoptera, C. Mosley, M.B.O.U. What is the Meaning of a Pupa? Norman H. Joy, M.R.C.S., F.E.S., M.B.O.U.87 Some Forms of Pieris brassicae, J. T. Lempke (Amsterdam) 88 The Spring of 1931 in Kabylia, Miss L. M. Fison 90 Notes on Collecting. - Byturus fumatus in Buttercups, H. Donisthorpe: Early appearance of the Red Admiral, Id.: Psilota anthracina (Dip.) in Windsor Forest, Id. 93 CURRENT NOTES 94 REVIEWS.—Die Biologie der Kleinschmetterlinge, R. T. Schütze, W.F.: "Entomology and Ethics," Wm. Fassnidge, Hy.J.T. ... 95 SUPPLEMENT. - British Noctuae, H. J. Turner, F.E.S., F.R.H.S. (233)-(236)

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Lepidoptera at Dieulefit (Drôme) in April, 1930 and 1931.

By WM. FASSNIDGE, M.A., F.E.S.

(Concluded from page 55.)

It is hardly to be expected that in the month of April there will be many butterflies flying in this locality, and the total of 42 species seems quite a respectable one. Anthocharis euphenoides, Stgr., was everywhere common from the beginning of our stay, and could be found at sunset and on dull days resting on the flowers of Biscutella laevigata, L., sometimes several on a plant. In bright sunshine the larva of the Mantid Empusa pauperata, Latr., would lie in wait for this species and catch one male after another as they settled on the flowers, devouring their bodies with incredible speed. A. tagis var. bellezina, Boisd., appeared in the middle of the month, and was not uncommon on several stony hillsides where its foodplant Iberis pinnata, L., grows. As always they were very difficult to catch, except on days when occasional big clouds obscured the sun, and it was possible to take them resting on grass stems during the recurrent short periods of dullness. Pieris manni, Mayer, occurs here on the hillside as one might expect, and Polygonia egea, Cram., was a regular visitor in the morning to the flowers of laurel on the terrace of the pension. I searched long for the foodplant of P. egea, Parietaria officinalis, L., hoping to find larvae of this species, but could only find a few scattered The Spring blues, Scolitantides (Polyommatus) baton, Bergs., Glaucopsyche melanops, Bdv., and G. cyllarus, Rott., were very scarce in 1930 but were all fairly common in 1931, the specimens of the lastnamed being much smaller than any I have seen before. At the very end of our stay Cupido sebrus, Boisd., began to emerge, but we could not wait to see it plentiful. Of butterfly larvae worthy of note, we found Melitaea deione, Hb., in countless numbers on every wall where the ivy leaved toadflax grew, especially abundant on the walls of the terraces of the pension. They fed also on what I thought was a species of thistle growing as a weed in the garden, and mostly pupated by the end of April. Larvae of M. aurinia, Rott., were abundant, feeding indifferently on scabious or honeysuckle, this being the first time I have seen them feeding in nature on the latter plant. In the stony torrent beds and on bare hillsides the small larvae of M. pseudathalia, Reverdin, were locally common feeding in groups on young plants of Digitalis ambigua. At home they fed up fairly well on narrow-leaved plantain. I probably should not have noticed these larvae had not my attention been attracted by the curious appearance of some of last year's stems of this rather local plant. They had been gnawed off a few inches above the ground in the same manner as other stems are gnawed off by the larvae of certain longicorn beetles, for example, as larvae of Ayapanthia cardui, L., gnaw off the stems of Salvia pratensis, L., and A. asphodeli, Latr., those of Asphodel. The stumps had been neatly stopped with gnawed and stringy particles of stem, reminding one forcibly of the work of Eucosma foenella, L., in stems of Artemisia I brought home a number of these tenanted roots, finding incidentally the larvae of M. pseudathalia feeding on the new leaves, and forced out in May and June a good series of Argyroploce lapideana, H.-S.

Of Bombyces 28 species were observed, among them Eucharia festiva, Hufn. (hebe, L.) of which males came fairly freely to the town lamps; Diacrisia cesarea, Goeze, one male at light; Cymbalophora pudica, Esp., larvae common after dark on grasses; Hyphoraia testudinaria, Fourc., a few larvae in 1930, and one male at light in 1931; Euprepia striata, L., larvae fairly common on low plants after dark; Celama thymula, Mill., local and not common; Saturnia pyri, Schiff., imagines at light and cocoons under copings; Notodonta anceps, Goeze (trepida, Esp.), Pheosia tremula, Cl., and Drymonia chaonia, Hb., all fairly common at light; Eriogaster catax, L. a few nests of larvae on hawthorn, imagines from which emerged in November, although the majority of the pupae are lying over. Searching by day yielded a fair number of larvae of Zygaena rhadamanthus, Esp., nearly full grown on Dorycnium suffruticosum. I was obliged to bring a good supply of the foodplant home with me and fortunately managed to rear a good series. A most interesting sight was noted one Sunday morning in the park of the neighbouring chateau, where by far the longest procession of the larvae of the pine processionary (Thaumatopoea pityocampa, Schiff.) that I have ever seen was observed crawling slowly along a hard gravel path and laboriously digging itself in for pupation. When we came across them a seething mass of larvae showed that many had already disappeared, but there still remained head to tail in single file no less than one hundred and eighteen. We amused ourselves for about half an hour by watching them and repeatedly timing their rate of progress, arriving each time at the figure of about ten inches or five lengths every two minutes. The whole long string resembled nothing so much as a long thin yellow and black speckled snake, and I am bound to confess that when I suddenly saw it right at my feet, I jumped backwards in alarm. Perhaps I may be allowed here to state what has been my experience with regard to the urticating properties of these larvae. For years I handled larvae and nests with complete impunity, even going so far one August as to make exhaustive search for beetles in every old larval nest that I could find and reach. Yet in 1930 at Dieulefit, having decided to breed the species once more, after picking up a procession of some forty larvae on their way to pupation, I found next morning that I had every symptom of a violent cold in the head, with great irritation of the eyes and lips and of the mucous membrane of the nose. Small blisters appeared all over the face and altogether for about 24 hours I felt and looked a very sorry object. My wife a day or two later had almost exactly the same experience through carelessly handling and shaking the bag which had contained these larvae. It may be that the period of wandering that immediately precedes pupation is the time of greatest danger, possibly owing to the fact that the urticating hairs then break more easily into short pieces, which are carried in the air to any tender part of the skin.

Of Noctuae about 40 species were observed, mostly at the catkins of various species of Salix growing by every stream and in every torrent bed. Even on cold nights moths are swarming at these "sallows": Panolis flammea, Schiff. (piniperda, Panz.), Monima miniosa, Schiff., a dark purple form of Triphaena rubricosa, Fb., Melanchra conspicillaris, L. typical and varieties, Xantholeuca croceago, Schiff., very different from our bright form, Polyploca ridens, Fb., hardly

recognisable at first sight, Conistra standingeri, de Gras., etc. At the town lamps we took Valeria jaspidea, Vill. odd specimens, Luperina leucophaea, Schiff., Euxoa turatii, Standfuss, among other less interesting species. Noctuid larvae were abundant after dark, but except for a single specimen of Rhizotype flammea, Esp., only common species were bred, such as Sideridis vitellina, Hb., Leucania albipuncta, Fb., Triphaena fimbria, L., Agrotis comes, Tr., A. pronuba, L. Sugar yielded very little and was soon abandoned. Beating for larvae on oaks whose young leaves were just appearing yielded small brown larvae of Hylophila bicolorana, Fuess., not uncommonly, and from them I bred one nice variety with the lines on the forewings quite close together.

Of the 25 species of Geometers observed those perhaps worthy of record are Hydriomena polygrammata, Bkh., Scodiona lentiscaria, Donz. at light, Aleucis victoria, Curt. fairly common on low blackthorns by night, and Selenia lunaria, Schiff. From larvae were bred Eupithecia oxycedrata, Rbr. and Synopsia sociara, Hb. At the end of April a Pyralid turned up that was new to me, disturbed from herbage by day, but unfortunately it has not yet been indentified. Larvae of Adaina microdactyla, Hb., were found in old stems of Eupatorium cannabinum by the stream; in the grounds of the Château among spruce a few larvae of Dioryctria abietella, Fb., were found spun up for pupation in or on fallen cones, and larvae of Caterenna terebrella, Zinck., were fairly common in small aborted cones at the same time and place. The Tortrices were represented by 14 species. Larvae of Laspeyresia strobilella, L., were very abundant in newly fallen spruce cones; L dorsana, Fb. flew in bright sunshine near to patches of its foodplant; Pammene splendidulana, Guen. swarmed around the tops of young oaks; Eucosma pauperana, Dup., rewarded in fair numbers much hard work among old bushes of Rosa canina; Chlidonia baumanniana, Schiff., was locally fairly common among white scabious; galls of Evetria resinella, L., were not scarce on the hillside Scots pines; and E. duplana, Hb. flew sparingly among young pines and heather. Tineids were naturally not much in evidence at this early date. Larvae of Metzneria carlinella, Stt. occurred high up on St. Maurice and probably elsewhere; cases of Coleophora onosmella, Brahm. were quite abundant on Echium, on which plant a few larvae of Ethmia pusiella, Röm. were also found. Psychidae were very scarce; Epischnopteryx pulla, Esp. flew by day, and one male of Psyche constancella, Bruand was bred from cases found on a roadside bank.

One unusual observation was made at Dieulefit. A number of cats were kept about the place in the usual half-starved condition which the French consider necessary if the animals are to catch any mice. One of these cats was observed repeatedly lying in wait among the flowering double stocks until a Pieris brassicae or Gonepteryx rhamnicame to alight upon them, when it would dexterously catch the insect in its forepaws and eat it wings and all. The same cat used every night to haunt the window ledge outside the salon and catch and eat every moth that fluttered to the glass attracted by the light.

Of course it can hardly be expected that a locality no further south than Dieulefit will yield very much so early in the season as the month of April, but enough has been said to give some idea of the possibilities of the place, which would undoubtedly pay for working throughout the Spring and Summer. If only future visitors to France do not confine their attentions to the Rhopalocera, or to the genera usually included among the Macro-lepidoptera, but will collect also the so-called "micros." they will almost certainly discover species hitherto unknown, and will at all events add largely to our knowledge of distribution and of life-histories, where so much still remains to be done.

A List of Lepidoptera on and around Breakback Hill, Bromsgrove, Worcs., 1927-1931.

By P. SIVITER-SMITH.

The soil on the Hill appears to be a fairly stiff clay, with considerable outcrops of sandstone on its southern extremities (Rock Hill), well timbered, elm and oak being about equal in numbers, with smaller quantities of sycamore, horse-chestnut, etc. There are one or two little marshes near Grafton Manor, the chief one, Longpool, being between Grafton and Breakback. Alderley and Cobbler's Coppices consist chiefly of oak, on the western side of the Hill. The northern and eastern boundary is Battlefield Brook running through Whitford Mill by the Rifle Range.

The Rhopalocera of the district are not particulary interesting, being the usual species to be found in well-grazed pasture land, so mention will only be made of two species.

Brenthis (Argynnis) euphrosyne, L.—"Common in some years" (on the Rifle Range). [Report of B'gve School Nat. Hist. Soc., Vol. I., part 2, 1931.] I have not observed this species, but it is apparently common.

Melitaea aurinia, Rott.—Mentioned by the Rev. F. O. Morris as occurring "behind Grafton" and at "Whiteford Mill" but searches in both places failed to disclose them. Longpool is undoubtedly meant by "behind Grafton."

In the Heterocera, the list of Noctuidae is very small owing to the

fact that sugaring, etc., could not be indulged in.

Mimas (Dilina) tiliae, L.—I found a female drying its wings at the base of a large elm between Whitford Mill and the Parish Church in 1927. This is really outside the district, but I mention it as it is the only record that has come to my notice.

Cosmotriche potatoria, L.—The larva is comparatively common, but

should be worked for along roadsides.

Spilosoma lubricipeda, L. (menthastri, Esp.).—Larvae common.

Diaphora mendica, Cl.—I found one pair in the grass by Whitford Mill in 1929.

Arctia caja, L.—Larvae not as common as in the Ran-dans.

Hipocrita jacobaeae, L.—Commonly observed near the Gas Works

and on the way up to the Hill by that route.

Acronicta leporina, L.—I found one specimen (var. bradiporina, Treits.) of this uncommon species on an elm tree on The Hill, June 22nd, 1930. I also have another poor specimen, found by a boy the previous year, but where exactly I do not know.

Acronicta psi, L.—To be found resting on tree-trunks.

A. megacephala, F.—Not uncommon on tree-trunks; pupae may be found under bark on willow trees.

A. rumicis, L.—Found with the two previous species.

Diloba caeruleocephala, L.—The larvae can be found on the longer shoots of hawthorn hedges that are kept in good order.

Amphipyra pyramidea, L.—I have found young larvae of this species

near Grafton Manor and at Alderley Coppice.

Taeniocampa gothica, L.—A very dark imago hatched from a pupa I dug from under an oak tree in 1930.

Heliaca tenebrata, Sc.—Common in suitable waste patches on the Hill and near Grafton.

Plusia gamma, L.—Common.

Euclidia mi, Cl.—Common all over the district.

E. glyphica, L.—As last, and in company with it. Ortholitha chenopodiata, L. (limitata, Sc.)—Common.

Lobophora halterata, Hufn.—This local species is confined to Longpool, where, if carefully approached, it may be boxed from Poplar It is very little use climbing for them as they are so easily I have caught var. zonata, Thinbg. there too.

Euphyia (Cidaria) corylata, Thnb.—Found at Longpool and

Alderley, but not commonly.

Xanthorhoë montanata, Bkh.—Common,

X. fluctuata, L.—Not uncommon on the Hill.

X. alternata, Müll. (sociata, Bkh.)—Common. Camptogramma bilineata, L.—Very common.

Coenotephria (Anticlea) derivata, Schiff. (nigrofasciaria, Gz.)—Can be found in some numbers around Grafton Pond and in a neighbouring orchard.

Eupithecia centaureata, Schiff. (oblongata, Thnb.).—Not uncommon on tree-trunks.

Cabera pusaria, L.—Quite common.

Campaea (Metrocampa) margaritaria, L.—I have found one or two resting on nettles on the Hill at various times.

Plagodis (Eurymene) dolabraria, L.—On June 8th, 1930, I found two, both freshly emerged, on the Hill. Both were on fruit trees.

Opisthograptis luteolata, L.—Quite common.

Biston (Pachys) strataria, Hufn.—On March 25th, 1930, I found a dead specimen, and a boy caught one in 1931, both on Rock Hill.

Zygaena lonicerae, Esp.—To be found on a waste patch of the

Hill facing the town, and all around Grafton.

Z. filipendulae, L.—With the last mentioned species.

Adscita (Ino) statices, L.—There is a colony on the waste patch of the Hill mentioned above. June 22nd is a good date for them.

Hepialus humuli, L.—Fairly common. I took the largest female

on the Hill that I have ever seen.

H. lupulina, L.—Fairly common. Sometimes to be found at rest on nettles.

Some species of Parasitic Hymenoptera found with Ants.

By HORACE DONISTHORPE, F.Z.S., F.E.S., etc.

Mons. Ferrière has been good enough to name for me a certain number of Parasitic Hymenoptera, which I had found with ants and put on one side, as I was unable to get them identified here-to-fore.

As they are not mentioned in my book "The Guests of British Ants," it is well to place them on record now. I believe most of them are parasitic on Diptera and may have no, or at any rate no direct, connection with ants; but never-the-less they were all taken with ants, or bred out of ants nests:—

Chalcididae.—*Ecrizotes filicornis*, Th., bred out of an observation nest of *Formica rufa*, L., from Oxshott, 19.iv.04. This is a new gonus and species to Britain; it belongs to the *Pireninae*.

Lamprotatus tarsalis, Walk., bred out of an observation nest of

Formica rufa, L., from Weybridge, 31.iii.08.

Arthrotylus maculipennis, Walk., taken in a nest of Acanthomyops (Chthonolasius) flavus, F., at Whitsand Bay, Cornwall, 14.iv.09.

Micromelus pyrrhogaster, Walker, taken with the above.

Tetrastichus roesellae, Nees., taken in a nest of Acanthomyops (Dendrolasius) fuliginosus, Latr, at Cothill, 30.vi.09.

Pleurotropis epigonus, Walk., bred out of an observation nest of

Formica fusca, L., from Porlock, 23.v.07.

Micromelus pyrrhogaster, Walk., bred out of the above nest, 30.v.07. Microterys clavellatus, Dl., 3 specimens bred out of an observation nest of Formica rufa, L., from Nethy Bridge, 12.vi.13.

Halticoptera sp.? bred out of the above nest, 14.vi.12.

Habrocytus sp. ?, taken in a nest of F. fusca, L., at Kingswear, 23.iv.08.

Approstocetus sp. ?, bred out of F. rufa observation nest from Oxshott, 12.v.04.

CYNIPIDAE.—Allowysta perplexa, Cam., taken in a nest of F. fusca var. glebaria, Nyl., in the New Forest, 22.vii.18.

ICHNEUMONIDAE.—Gelis (Pezomachus) corruptor, Först., taken with A. (D.) fuliginosus at Weybridge, 8.ix.14.

Gelis (Pezomachus) instabilis, Först., running in company with \(\psi \) of A. (D.) niger in Windsor Forest, 3.vii.31.

On the "Illustrations of Varieties of British Lepidoptera," by S. L. Mosley (1878-1885?).

My attention was recently called to an article on this subject which appeared in your issue of November, 1931, and which I have since perused with much interest. Mr. Griffin has done well to tabulate for a generation nearly fifty years afterwards, the magnificent contents of this unique work. As he has said, the work is very rare, and so far as I know, nothing has ever been attempted on the same lines either before or since. I was two years old when my father began this work, consequently could not have had much personal interest in it at the time! In fact I had never been so fortunate as ever to see a copy

until a few months ago, when I purchased a complete set in parts from a second-hand bookseller—incidentally having to pay a very stiff

figure for it.

Mr. Griffin's tabulation, valuable though it is, does not convey anything of the exquisite delicacy and beauty of the drawings. Although perhaps I ought not to wax eulogistic, owing to my personal relationship, S. L. Mosley was an artist, who has possibly not had an equal in his own particular line, and I venture to suggest that his earlier works show him to much better advantage than do his later ones, when he rather tended to mass production and consequently his sketches lost much of the individual delicacy which he put into every sketch before-time.

Simultaneously with his Varieties of British Lepidoptera, my father was issuing Illustrations of European Butterflies, which was upon an even more magnificent scale. Of this too, I had never seen anything but very occasional unfinished plates; I have now become possessed of a perfect complete and clean set, for which I had to pay dearly, but

which I would not re-sell for ten times what I gave for it.

During the whole of his life, S. L. Mosley was the producer of voluminous literary and artistic works, and knowing him so well, as I ultimately was privileged to do as his son, I saw in him certain peculiar traits, which are manifest even in these early works, but which a casual observer might never detect. He always started off a new project with impetuous enthusiasm, which however failed to be sustained for any great period. It was not, however, that his interest abated, but rather because his fertile mind was conceiving other fields to explore and in his eagerness to be there he tended to neglect the unfinished task already in hand.

The fourteen parts which Mr. Griffin has so ably analysed, were not the only *Illustrations of Varieties* which my father produced, although probably it was his best, and if the Editor of the *Record* cares to have it, I shall be glad to contribute thereto an article dealing with such other works of that character as I have knowledge of.—Charles Mosley, M.B.O.U., The City Museum and Art Gallery, Wakefield.

May 21st, 1932.

What is the meaning of a pupa?

By NORMAN H. JOY, M.R.C.S., F.E.S., M.B.O.U.

I am writing another book now on quite different lines from my Practical Hand-book of British Beetles, and I want to refer to this subject. The average entomologist has never given it a thought, as he is a mere collector of Lepidoptera. There are some who realise there are other orders of insects, and there are even a few now who realise that an insect is a living thing, and not a mere specimen. This is referred to very well by Mr. W. Fassnidge in his Presidential Address to the Entomological Society of the South of England, 1931. In my coming book I shall go into the question "What is a species?" from what I think is quite a new light, which will be ignored by the average entomologist, because it is new!

One of the greatest strongholds of the truth of evolution is the study of Embryology. We profess to know now that the bird first came

into this world in water, because the examination of a bird's egg on the fourth day of incubation, reveals what almost exactly resembles a tadpole, having no wings or legs, but gills and a tadpole like tail. The embryo of man has gills, cleft-palate and hare-lip, signifying what

our very ancient ancestors were like, and where they lived.

Let us try to trace back the life-history of an insect. particularly want to know is a Dipteron, as for instance the common house-fly. On the same lines presumably this was once like its larva, the "maggot," with the same nervous system, intestinal tract, and breathing apparatus, a very simple organism. This pupates, and this, by analogy, traces up the rest of its life-history, I understand (I want to know if correctly) that its epidermis is altered, so as to form the pupal case, and it is the contents of this which we must examine. I have spoken to several who ought to know, and they declare that the whole of the internal structure of the "maggot" is completely broken up, except the cental nervous system. Out of this pupa there comes, I think I am right in stating, in less than a fortnight, a fully developed fly, with its very elaborate head, thorax, abdomen, wings and legs. Nothing whatever is known about how these are formed, and I believe no one has really seriously troubled to try to find out, because it would be a very difficult thing to do.

We can of course trace up the life-history of a chicken in the egg, but here we have a blank between the larva and the imago. Examination of the pupae of the Lepidoptera does not help us. Here we have no gradual growth of the wings, antennae and legs, as we have in the wings and legs of the chicken, but their sudden appearance, but not quite fully developed. Think of the complete change there is between the larva and imago of the Dipteron; what was the insect like in the world between these times? Why this apparent sudden jump from one to the other? It is a question which has probably been brought up at some time before the Entomological Society. It, at any rate, most certainly ought to have been. I have an idea myself to account

for it, but I want the opinions of others.

On some forms of Pieris brassicae, L.

By T. J. LEMPKE, Amsterdam.

In 1929-1930 (Entom. Record, Vols. XLI. and XLII.) Messrs. G. S. and W. Graham-Smith published their excellent study of Pieris brassicae, L. As a number of forms, described by Rocci in 1919 (Atti Soc. Lig., Vol. XXX., No. 1), are not cited by the authors and as these forms are neither to be found in the Supplement of Seitz nor in the Novitates of Bang-Haas, I think it very nseful to give an account of Rocci's forms and to discuss the synonymy of one or two of them. As special spring forms Rocci described:

1. ab. nigroviridescens, Rocci, p. 16. "Specimens in which the underside of the hindwings is of a greenish colour, extraordinarily suffused with black scales, assuming an obscure green tint." To this

name anthrax, Gr.-Smith, certainly falls as a synonym.

2. ab. flavopicta, Rocci, p. 16. "The ground colour of the underside of the hindwings of a yellowish colour, very little suffused with black." ab. pallida, Gr. Smith, seems to be an extreme form of

this aberration. It must be observed, that Rocci used as much as possible the names proposed by Verity for the genus *Pieris*. Of course this is well done, but it is wrong to consider Verity as the author, as Rocci did. Verity has never described a *Pieris brassicae* ab. *flavopicta*. The first who did this was Rocci himself. I think it necessary to point out this mistake especially, as such kinds of errors are often made at present.

3. ab. emigrisea, Rocci, p. 17. "The apical blotch is completely pale greyish (as in rapae metra), but the other spots (of the 9 9) remain of a deep black." A synonym of ab vazquezi, Oberthür, 1913.

4. ab. parromaculata, Rocci, p. 17. "Some & & of the preceding form have the spots much reduced, not much larger than in rapaemetra."

Further Rocci described:

5. ab. trimaculata, Rocci, p. 20. "With an extra dot between the two normal ones on the forewings of the female. Rare and exclusively in the second generation."

6. ab. nana, Rocci, p. 20. "Very small examples of the first

generation." A synonym of minor, Ksienschopolsky, 1911.

7. ab. griseopicta, Rocci, p. 20. "The markings of the forewings are strongly suffused with white; a further grade of the modification shown by emigrisea and which is only found in specimens of the first generation." It differs from vazquezi, Ob., that all the markings are greyish.

8. ab. striata, Rocci, p. 20. "The discoidal spot is united to the apical one by one or two lines. Examples of the second and third generation." ab. biligata, Cabeau (1925), is a synonym of this form.

9. f. meridionalis, Rocci, p. 18, is called the second generation of the Italian Riviera. It is very large (9 9 65-70mm.), has strongly developed black markings, the discoidal spot is often united to the apical blotch. Intermediate between lepidii and catoleuca.

Another form, not dealt with in the article on Pieris brassicae is:

ab. separata, Pionneau, L'Echange, Revue Linnéenne, January, 1928. "Differs from the type by the second spot of the forewings on the

undersides, which is divided into two very distinct parts."

I must further add, that the synonymy of the ab. fasciata, Kiefer, as stated by Messrs. Graham-Smith, is not quite right. Ab. maria, Van Mellaerts (Lambillionea, 1926, p. 84) is the only good name for the form in which the two discal spots are united by a suffusion of black scales, while ab. fasciata, Kiefer (Zeitschr. Oesterr. Ent. Ver., vol. III., p. 122, with figures) is the form, in which not only the two spots are united to each other, but the upper one also by two black lines to the apical blotch, as the original description of Kiefer ("connected to each other and to the hind margin of the forewings") and his figure clearly show. So ab. maria is not a synonym of fasciata, but ab. alligata, Cabeau (Revue Mens. Nam., 1924, p. 25). The result is that we have: ab. maria, Van Mellaerts, with the two sub-forms abs. supraand infra-fasciata, Gr. Smith, and ab. fasciata, Kiefer (=ab. alligata, Cabeau). It is a real pity that Van Mellaerts' name must be re-established. One should never name an aberration after a person, be it one's wife, or a kind cousin, or "the dear hand which made my net," as a German author writes. In the Supplement of Seitz Chr. Bollow has rightly treated the synonymy of these two forms.

Of course this little correction has not in the least, the intention to diminish the great value of Messrs. Graham-Smith's study. Such articles are published only too little. It would be for continental (and British) entomologists of very much value, to know the range of variation of the common British lepidoptera and the great riches of the collections in the British museums. And therefore it would be very interesting to study for instance Pieris rapae, L., and P. napi, L., Epinephele jurtina, L. and E. tithonus, L., Satyrus semele, L., Pararge aegeria, L. and P. megera, L., Aphantopus hyperantus, L., and Coenonympha pamphilus, L. (to take only the common Rhopalocera) as seriously as Messrs. Graham-Smith did for Pieris brassicae. Such work costs a great deal of time and trouble, but the value of it is far greater.

The Spring of 1931 in Kabylia.

By Miss L. M. FISON. (Concluded from page 76.)

April 11th.—We went to a distant village about four hours from Michelet and in a deep ravine we saw G. rhamni, A. belia, E. eupheno, the "whites" and Papilio podalirius. Melitaea didyma appeared for the first time, also the "blue" Glaucopsyche melanops, we saw too Pararge aegeria, T. ballus and Rumicia phlaeas, also some "skippers" which we failed to capture.

April 15th—We went to a village called Ait Ailem and found the following butterflies *P. podalirius*, the three "whites," *G. melanops*, *P. aegeria*, *Pyrameis cardui*, *E. polychloros* (1), *Polygonia egea* (worn), *Anthocharis belia* (ausonia) and *E. eupheno*, also Coenonympha pamphilus

and C. arcanoides.

April 16th.—We had a very good day near Ait Saïda and found the following insects, P. podalirius, A. belia (ausonia), E. eupheno, Lycaenopsis (Cyaniris) argiolus, (singly) and Agriades thersites (?) also C. rubi, C. avis (?), Rumicia phlaeas, T. ballus, C. croceus (edusa), P. cardui, C. pamphilus and E. polychloros.

April 17th.—On a lavender-covered slope near Michelet we found Glaucopsyche melanops abundant and fresh, flying with Rumicia phlaeas, and the two "Whites," we also took P. podalirius, E. eupheno, and T.

ballus.

April 18th.—We saw the same species near the villages of Tassaft Ongoumoun, together with G. cleopatra, C. avis, C. rubi,

and Pararge megera.

April 28th.—We took the early bus and spent a day in the low-lying Oued Aissi and found Anthocharis belemia flying fine and fresh over fields of fresh corn, with P. rapae, and I rather think P. mannii. We also took C. pamphilus, R. phlaeas, P. aegeria, P. cardui and E. eupheno (going over.)

April 29th.—Near Agoni-Taslent we found Melitaea didyma fine and fresh, also R. phlaeas, P. sertorius (sao), P. icarus 3 and 9, C. arcanoides, P. cardui, E. eupheno, P. podalirius, T. ballus (going over),

and G. melanops.

May 10th.—Near Ait Moraou we took C. rubi and C. avis, C. arcanoides, G. melanops, P. icarus, P. megera and P. aegeria, C. pamphilus,

P. podalirius, P. brassicae, A. belia (ausonia), E. eupheno, P. cardui, E.

polychloros, Powellia sertorius (sao).

May 17th.—We went to Tagnemount and Abdoun, and came across 6 M. didyma, P. aegeria, P. megera, T. ballus, G. melanops, the "whites" C. arcanoides, C. pamphilus, P. cardui, E. eupheno (going over), C. avis (?) and R. phlaeas.

May 15th.—Near the Oued Djemaâ we took M. didyma, P. cardui, L. argiolus, P. icarus, Aricia medon, C. arcanoides, Euchloë eupheno, the "whites," P. sertorius (sao), C. pamphilus and Euchloë belia (ausonia).

May 21st.—At Michelet we saw P. atalanta, P. megera, Colias croceus, G. melanops, (going over), E. belia (ausonia) P. cardui, and some "whites."

At the end of May we left Kabylia until mid-September. So we must wait for another year to describe the summer months around Michelet. After our return we found several Dryas pandora (worn) on a slope above Michelet—and the following butterflies have been quite common locally around Michelet until about December 8th, Colias croceus, Pyrameis cardui, Rumicia phlaeas, Pararge aegeria, Pararge megera, Anthocharis belia (ausonia), Coenonympha pamphilus, Gonepteryx rhamni, Eugonia polychloros, Pyrameis atalanta and we have also come across Polyommatus icarus and Aricia medon. However since this date we have had very wintry weather with heavy falls of snow (67-70 centimetres) so this will probably be the last date now until the spring of 1932. May 1932 enable us to discover much more of interest—and many more of the secrets which still remain unravelled of the butterfly fauna of this fascinating region of Kabylia.

In conclusion it may be of interest to add a little about the habits and variation observed in some of the above above mentioned species.

Papilio podalirius.—Common locally around Michelet, i.e. Agoni-Taslent, 6.iv.; Michelet, 9-10.iv.; Tamjoat, 15.iv.; Ait Saäda, 16.iv.;

Iril Ouammas, 11.iv.; Ait Ailem, 15.iv.; Ait Moraou, 6.v.

Podalirius was particularly common at one spot close to Michelet so much so that we named this spot "Swallow-Tail corner." For several weeks each time we passed there we found one or several settled on a thorn-bush in the same spot—in spite of our capturing several specimens from there. I have not yet come across P. machaon near Michelet. Our specimens of podalirius vary in size—also in some specimens there is a decided whitening of the ground colour—still none can really be referred to the var. feisthamelii. In one or two specimens I note on the upperside hindwing that the long black streak is divided by a bright orange line—so I refer these to the ab. ornata, Wh.

Zerynthia (Thais) rumina.—Port Gueydon, 19.iii.; Aggribbes, 26.iii.; Michelet, 10.iv. I can refer two of my specimens to the ab. canteneri, one specimen was taken at Aggribbes and the other at Michelet,

rumina seems fond of settling on stones near flowers.

Pieris napi.—Very fine and fresh near Michelet at Easter-time.

Pontia daplidice.—I fancy I saw a specimen near Bou-Messaoud in early November, but cannot be sure as I failed to catch it.

Anthocharis belemia.—Very fine and large in Oued Aissi on 28.iv. It varies somewhat in size; also taken at Michelet on 3.iv. and at Fréha, 20.iv.

Euchloë belia (ausonia).—One of the commonest of butterflies, well-

distributed over the region. It varies vary greatly in size, also in the markings of the upperside, especally in the size and depth of costal

spot. I rather fancy I have two specimens of Euchloë tagis.

Euchloë eupheno.—This pretty little southern "Orange-tip" is the commonest of spring butterflies, and may be seen everywhere fluttering gaily over the spring flowers. Both $\mathcal J$ and $\mathcal D$ vary very much in size. In the $\mathcal J$ I have one or two specimens without the black discoidal spot; and in other specimens this spot is elongated into a long, black, sometimes wavy streak.

Gonepteryx rhamni.—Undoubtedly hibernates in Kabylia.

Colias croceus (edusa).—First observed on March 9th, at Port Gueydon, last seen near Michelet on December 7th.

Pararye aegeria.—Locally to be found, but never really common. Usually seen singly. I have a very small specimen from Port Gueydon. The size of eye-spots upperside hindwing vary very distinctly.

Coenonympha arcanoides.—Locally common in the region. It varies considerably in depth and breadth of dark suffusion on upperside, also in size and colouring of costal spots underside upperwing, and in position of spots on undersides hindwing.

Pyrameis atalanta.—Never abundant, but found locally. Apparently

some specimens succeed in hybernating.

Pyrameis cardui.—Perhaps the commonest butterfly in Kabylia, often in immense numbers. Last seen on December 7th.

Eugonia polychloros.—Frequents places where the "chêne-zéen" grows. Varies considerably in size.

Polygonia egea.—Occurs locally.

Melitaea didyma.—Very fine and bright orange, around Michelet, i.e. Taguemount and Tafraout, 7.v.; Oued Djemaâ, 15.v.; Agoni-Taslent, 29.iv. Dr. Verity reports it from Yakouren, another part of Kabylia. Didyma varies somewhat in depth of ground-colouring.

Dryas pandora.—Several specimens found on high sandy slope at

the back of our house at Michelet in mid-September, very worn.

Libythea celtis.—Agoni-Taslent, Easter Monday, so far the only locality I know of.

Cattophrys avis.—In several places, I think, around Michelet. Seems to frequent spots where the Cistus grows. Several of my specimens

of C. rubi may I think be referred to the var. fervida.

Thestor ballus.—One of the commonest of the spring butterflies all over the region. Varies somewhat in size, also in depth and suffusion of ground colour upperside. In one specimen a blue suffusion around the spots under-side front wing is very marked.

Kumicia phlaeas.—Flourishes all over the region. Especially common in the autumn. Varies somewhat in ground colour and in spots on upperside, also in size. A fine race, and strong on the

wing

Polyommatus icarus.—Found locally all around Michelet, never in numbers. I have a fine 2 ab. caerulea from Ait Meraou, 6.v.

Agriades thersites.—Met with locally.

Lycaenopsis argiolus.—Local, never more than two together. Aid Saäda, 16.iv.

Aricia medon.—Local, but fine and well-marked.

Glancopsyche melanops.—Well distributed locally in the region. Particularly abundant on sandy lavender slopes near Michelet (also

locally elsewhere) iv., v. Varies very greatly in size. I have one tiny specimen with black suffusion on front wings. The spots on underwings vary greatly too, in size and in number.

Coenonympha pamphilus.-Well distributed in the region, varies

somewhat in size.

Pararge megera.—To be found locally, never really abundant.

Hesperia sertorius (sao).—I wonder if my specimens should be referred to the race mahommedani?

OTES ON COLLECTING, etc.

BYTURUS FUMATUS, F., IN BUTTERCUPS.—On May 10th, 1893, I took two specimens of *Byturus fumatus*, F., in Windsor Forest, and on looking up my register for that year I find that they were taken by beating hawthorn blossoms in company with *B. tomentosus*, F.

Up to this year I had never found it again in Windsor Forest, although B. tomentosus has turned up freely, by beating hawthorn

and sweeping wild raspberry canes.

Last year having given the two Windsor specimens from my cabinet to Oxford for the Windsor collection, I was anxious to replace them, and I went down to Harpenden on May 21st, as Mr. Williams had told me it could be taken in a lane there, by beating hawthorn blossom: No blossoms were found, but eventually I swept four specimens off butter-cups. On May 18th, this year, we observed B. fumatus sitting in the butter-cup Ranunculus auricomus, L. ("Wood Crowfoot") growing in a lime tree avenue in Windsor Forest, and on sweeping these a series of the beetle was quickly secured.

Reitter and Ganglbauer give the flowers of dandelions; but B. fumatus, F. (the species with the large eyes) is evidently associated

with butter-cups.—Horace Donisthorpe.

EARLY APPEARANCE OF THE "RED ADMIRAL" (PYRAMEIS ATALANTA).—On April 26th, this year, when collecting in a willow swamp in Windsor Forest, a specimen of the "Red Admiral" was observed flitting about among the willows. On getting close to it, it was seen to be in very fine plumage, the colours being very bright.

When at this same locality on May 10th, this, or another specimen was again seen. It flew rapidly out of the swamp and across some fields, returning again after a short absence. It repeated this perform-

ance several times whilst we were there.—Horace Donisthorpe.

PSILOTA ANTHRACINA, Mg., A RARE DIPTERON TAKEN IN WINSOR FOREST.—On May 10th last when beating hawthorn blossoms for Coleoptera in Windsor Forest I captured a specimen of Psilota anthracina, Mg. Mr. Edwards, who kindly named it for me, tells me that it has only been taken in the New Forest in Britain here-to-fore, where some six specimens were taken by the late Colonel Yerbury, also off hawthorn blossoms. There were only two specimens in the National Collection of British Diptera.—Horace Donisthorpe.

WURRENT NOTES AND SHORT NOTICES.

We have received samples of long Stainless Steel Entomological Pins from Messrs. Taylor & Co., Ltd., whom we all know as Entmological Pin Makers. They have been and still are experimenting in this direction. So far only one guage of pin has been attempted, one that would only be useful for the larger and average sized butterflies and moths, and other insects,, and we think it an excellent pin at the start. Of course the real test will be how it will stand a course of years in the body of a moth in the presence of the body acids. Stainless steel is high priced, but this guage they estimate will be on sale at 7/6 per 1000 in packets of 100. We are anxious to know if stainless steel wire of guage suitable for the smaller Geometers and Tortrices can be produced at a reasonable cost. This guage pin is firm and appears not to have that flexibility which the well-known continental pins have, a good characteristic.

A while ago a small local publication came to our table, *Proc. Coventry N.H. & Sci. Socy.*, containing a short record of the doings of the Society in giving its members local information on various matters of Natural History of a local nature. An average of 44 at its meetings proves that considerable interest has been aroused. The meetings are held twice a month and in summer consist of country rambles. Much matter has been got into the 16 pages, and besides local notes, records of plants, etc., an account of the Tile Hill Nature Reserve, and two original articles. One of these last is from the pen of our sometime correspondent J. W. Saunt, A.L.S., on "Trypetidae (Dip.) in Warwickshire," giving an account of the species of this family he had met with during the last two seasons and a photograph of 5 species admirably reproduced and quite effective in giving five very clear figures of typical species of five different genera. In fact just the kind of paper which we wish our British dipterist readers would send us.

We should be very pleased to have notes on the Noctuid species we are about to deal with. Miana literosa, Phothedes captiuncula, Celaena haworthii, the Mamestra sps. abjecta, sordida, furva, albicolon, brassicae and persicariae. Among the queries are What is the haworthii of Graslin? and Where is the description of it? Of M. sordida (anceps) the reference and description of intacta, Peterson, and obscura, Th. Miegen. Of M. brassicae, Moore, the reference and original description. It often occurs that in local faunal lists aberrations are noted, described and named in Proceedings, Annuals, etc., with very limited circulation, causing additional and unnecessary synonymy both directly and indirectly. A month or two ago we published such a list of descriptions and names recorded by S. Mosley. Workers find the greatest trouble to dig them out. There are such publications as the Zoological Record, Staudinger and Bang Haas Novitates Macrolep. Katalog, etc., which endeavour to record all such names, but even then the publications themselves are unobtainable to the average student, even in large libraries. e.g., subsp. albiluna of fasciuncula, described by Kozhantschikov in Jahrbuch Martjanow Minussinsk. Siberia in 1929, is probably unattainable in this country except in the Brit. Mus. Library (Nat.

In the Verh. Ent. Ver. Hamburg-Altona Herr Warnecke has been contributing a series of notes on the Lepidoptera of Hamburg. Part

REVIEWS 95

V. dealing with the Noctuidae has recently been received, and contains the observations of the author with those of his fellow members of the Society. More than a hundred species are dealt with and there are descriptions of two new forms Acronicta auricoma, new f. basistriata and Mamestra advena, new f. purpurisata and a new subspecies rubrifera of Agrotis subrosea. More than 100 species are recorded with considerable notes on their larval variation and occurrence. There is a full account of Agrotis subrosea and its local forms. The species probably occurs by no means rarely on all the suitable marshy land in the area. Agrotis ripae is found on all the sea-coast lands suitable for the growth of saltloving plants. The author accepts Miana latruncula as a good-species.

REVIEWS AND NOTICES OF BOOKS.

K. T. Schütze, Die Biologie der Kleinschmetterlinge, published by the Internationaler Entomologische Verein at Frankfurt am Main; Price, cardboard covers 20 Reich Mark, half linen 23 RM: 235 pages; 1931.—This eagerly awaited work, whose sub-title further explains its scope, is from the pen of a veteran worker, well-known for his life-long researches in the field. As was expected the chief stress is laid on foodplants, times of appearance, life-histories, while descriptions of larvae are given when the information is new or not readily accessible. All the writings of previous authors such as Disqué, Hering, Kaltenbach, Kennel, Sorhagen, Stainton, Stange, have been utilised, and many errors that have been long in circulation are here corrected. arrangement is botanical, the plants with their hosts being given in the order of the Illustrierte Deutsche Flora of H. Wagner. This method is of course a very convenient one, for every microlepidopterist must also be a good botanist. Both generic and specific names are those of the Staudinger-Rebel Catalog, and only those families placed in Part II. of this Catalogue are dealt with, so that the Aegeriidae, Cossidae, Hepialidae and others now generally included among the "micros" receive no mention. Good indexes of both plants and insects—specific names only—make reference an easy task. It is a great pity that is was found necessary to use such a large number of contractions—it would hardly be an exaggeration to say that nearly every word of the text is contracted—but it will be found that these offer no difficulty to anyone having an ordinary knowledge of German, and their use alone made the production of the work possible by reducing its price to one that is already high enough for the English student at the present rate of exchange. No field lepidopterist can afford to be without this work, which contains a vast wealth of original observations compressed into a small space, and which marks a great advance in our knowledge, besides indicating where gaps still exist and where statements require confirmation. May we hope with the author that his labours may lead more entomologists to devote themselves to the study of the "micros," of whose life-histories we know after all so little, and especially that all those who style themselves lepidopterists may be stimulated to study in its entirety the order in which they profess to be interested.—W.F.

The Presidential Address to the Entomological Society of the South of England for 1931 by Wm. Fassnidge, M.A., F.E.S. has come to our table. It is entitled "Entomology and Ethics," and deals from all points of view with the ethical attitude of the serious student of entomology towards the objects of his study, with the rights and duties of the real entomologist, who finds intellectual pleasure in the study of insects. The author collects the opinions of those well-known in entomological science from Kirby and Spence to Darwin. The subjects "mere collectors" and "dealers" are fully discussed; the mania for "vars." and "abs.," the exchange and sale columns of our magazines, the "illegitimate use" of butterflies wings as ornaments and in schools. In this last connection we are urged to quote the remarks of the late Edward Step when writing of the Orchids. "In our own time, the war against Orchids has been intensified, paradoxically, by those who proclaim themselves lovers of the beautiful and curious. Possession and present gratification count with these persons more than the conservation of the species admired. The members of Botanical Exchange Clubs, too, when they come across a good thing, take a liberal helping to improve their powers of barter for a species they have not found—a distinctly commercial consideration, though not so regarded. Nature-study classes, and prizes for wild flower collections at local flower-shows, add to the waste and decimation." and Woodland Blossoms, III. 81). We were once induced to take a nature-study class of grown-ups for a ramble to Oxshott; among the objects noted were dragonflies in the teneral state, and the students were asked to leave them. They were annexed by several who lagged behind. The worst case of this kind we know was that which occurred to a well-known S. London naturalist, who took a party of school-teachers to the far-famed bank where Darwin's study of orchids was carried on for many years. The visitors were asked not to dig any of the plants from this sacred spot and they did not. But the following week members of the party returned and cleared the bank of orchids. No doubt true lovers of nature could illustrate the dangers of species extinction by numerous further examples. We would ask all entomologists to peruse this admirable address, containing as it does so much food for thought on ethical and other aspects of our beloved study.—Hy.J.T.

Corrections, etc.

On page 60 of the current volume, April number, the important word has dropped. It should read Aricia medon (agestis) ab. aestiva, Msly., line 7 from the bottom.

A correspondent has kindly pointed out that in the last volume, 1931, there are several printer's errors in the article on Mosley's Illus. Varieties Brit. Lep., viz., p. 162, line 2 from bottom for Pt. XIII. substitute Pt. XII., on p. 163, line 5, for Pt. XIII. substitute Pt. XII., p. 165 Fidonia plt. 2 was issued with part VI. Abraxas plate 1 was issued with part I. We are indebted to C. Mosley the Curator of the Wakefield City Museum and Art Gallery the son of the late S. Mosley for the above information.

We understand that owing to the Whitsun holiday there was some delay in the distribution of copies of the magazine. Our own copies came to hand on May 17th.

All MS. and EDITORIAL MATTER should be sent and all PROOFS returned to Hr. J. TURNER, "Latemar," West Drive, Cheam.

We must earnestly request our correspondents not to send us communications identical

with those they are sending to other magazines.

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EXCHANGES.

Subscribers may have Lists of Duplicates and Desiderata inserted free of charge. They should be sent to Mr. Hy. J. Turner, "Latemar," West Drive, Cheam.

Duplicates .- S. Andrenaeformis, Bred 1928, well set on black pins, with data.

Desiderata. Very numerous British Macro Lepidoptera. J. W. Woolhouse, Hill House, Frances Street, Chesham, Bucks.

Desiderata .- Species of Dolerine and Nematine sawflies not in my collection; list Bent .- R. C. L. Perkins, 4, Thurlestone Road, Newton Abbot.

Duplicates .- Albimacula*, sparganii*.

Desiderata. Ova of D.oo, pupae of X. gilvago, D. caesia. A. J. Wightman, "Aurago." Bromfields, Pulborough, Sussex.

Exchanges .- Living Eggs of Catocala fraxini and sponsa, exchange for butterflies of British Isles .- C. Zacher' Erfurt, Weimar, Street 13, Germany.

Duplicates.—Pyralina*, Salicis, Ianthina*, Orbicularia*, Repandata in variety, Doubledayaria, Black rhomboidaria*, Black virgularia* and others.

Desiderata.—Hyale, Welsh aurinia, Polychloros, Tiphon Agathina, Lunigera, Lucernea, Neglecta, Diffinis, Populeti, Gothica v. gothicina, White Leporina, Tridens Putrescens. Littoralis, Typhae v. fraterna, Rurea v. Combusta, Gilvago, Fulvago v. flavescens, Liturata v. nigrofulvata. Harold B. Williams, Woodcote, 36, Manorgate Road, Kingston Surrey.

Duplicates.—A large number of species of European and Palaearctic Rhopalocera and Heterocera.

Desiderata.—All British species especially those illustrating characteristics of an island fauna. Dr. Lor. Kolb, München 54, Dachauer-str. 409, Germany, and Franz Daniel, München, Bayer-str. 77, Germany.

MEETINGS OF SOCIETIES.

Entomological Society of London.-41, Queen's Gate, South Kensington, S.W. 7.

8 p.m. October 5th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. June 23rd, July 14th, July 28th.—Hon. Secretary, S. N. A. Jacobs, "Ditchling," Hayes Lane, Bromley, Kent.

The London Natural History Society.—Meetings first four Tuesdays in the month at 6.30 p.m. at the London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, W.C.1. Visitors admitted by ticket which may be obtained through Members, or from the Hon. Sec. A. B. Hornblower, 91, Queen's Road, Buckhurst Hill, Essex.

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IMPORTANT

TO ENTOMOLOGICAL SOCIETIES and MUSEUMS.

The Entomologist's Record and Journal of Variation.

(Vols. I-XXXVI.)

GONTENTS OF Vol. I. (Most important only mentioned.)

Genus Acronycta and its allies.—Variation of Smerinthus tiliae, 3 coloured plates—Differentiation of Melitaea athalia, parthenie, and aurelia—The Doubleday collection—Parthenogenesis—Paper on Taeniocampidue—Phylloxera—Practical Hints (many)—Parallel Variation in Coleoptera—Origin of Argynnis paphia var. valesina—Work for the Winter—Temperature and Variation—Synonymic notes—Retrospect of a Lepidopterist for 1890—Lifehistories of Agrotis pyrophila, Epunda lichenea, Heliophobus hispidus—Gaptures at light—Aberdeenshire notes, etc., etc., 360 pp.

CONTENTS OF VOL. II.

Melanism and Melanochroism—Bibliography—Notes on Collecting—Articles on Variation (many)—How to breed Agrotis lunigera, Sesia sphegiformis, Taeniocampa opima—Collecting on the Norfolk Broads—Wing development—Hybridising Amphidasys prodromaria and A. betularia—Melanism and Temperature—Differentiation of Dianthæcias—Disuse of wings—Fauna of Dulwich, Sidmouth, S. London—Generic nomenclature and the Acronyctidae—A fortnight at Bannoch—Heredity in Lepidoptera—Notes on Genus Zygæna (Anthrocera)—Hybrids—Hymenoptera—Lifehistory of Gonophora derasa, etc., etc., 312 pp.

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CONTENTS

A New Genus of Psychides, Rev. C. R. N. Burrows, F.E.S. (Plate I.)	97
Brachypterous Earwigs. A Problem for Field Workers, Malcolm Burr, D.Sc., F.E.S	98
A Holiday at Braemar, E. A. Cockayne, D.M., A.M., F.E.S	99
On "Illustrations of European Butterflies," S. L. Mosley, C. Mosley, M.B.O.U	102
The Geographical Variations of B. euphrosyne, $Roger\ Verity,\ M.D.$	110
CURRENT NOTES	115
SUPPLEMENT.—British Noctuae. H. J. Turner, F.E.S., F.R.H.S. (237))-(240)

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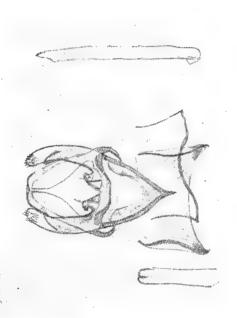
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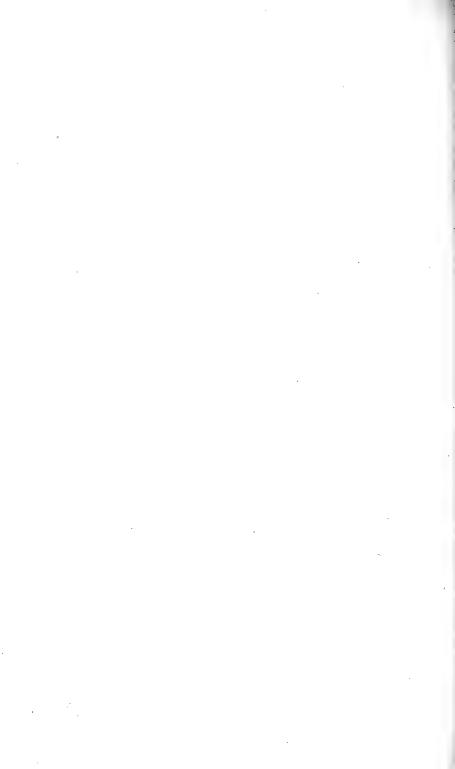
. XLIV.



del C. R. N. Burrows.

Male Genitalia of Acentra vestalis.

The Entomologist's Record.



A New Genus of Psychides. (With Plate I.)

By REV. C. R. N. BURROWS, F.E.S.

In my "Notes on the Psychides" in the Ent. Record, XXXV, p. 9, 1923. I placed the species restalis tentatively under a separate heading as. although agreeing generally with the genus Bijugis, in which it had hitherto been placed, it has no trace of a spur on the anterior tibia. This species has been distributed under the name Psychidea vestalis. In the British Museum collection there were, when I went through them, four male specimens in the Hoffmann collection, but I have seen no others, except such as have subsequently come into my hands. In my possession there appear to be four distinct species, which are spurless; some were sent to me as nudella, to which they bear a close resemblance, but can readily be separated by the short spur in nudella. These specimens are markedly smaller than any species included in either the genus Psychidea or in the genus Bijugis. The wings are inclined to be on the narrow side and not so broad in proportion as the well known casta, nor have they the curved costa of the latter species. In colour the wings are grey to white. The fringes are pale, and in a strong light conspicuously white. The antennae are well pectinated and pointed, the pectinations being of medium length throughout, only diminishing near the point. To this genus I assign the name **Acentra** from the Greek a, without, and hentron, point or spur, the absence of the anterior tibial spur being the chief point of differentiation from allied genera.

1. Acentra restalis.—The form to which I restrict the specific name restalis and of which I have three specimens, is the smallest species of this genus I have met with. No. 951 type of genus. The wing measurement 10mm. The colour of these three is pure white without admixture of grey; all are from Hungary. Case slender, long,

cylindrical.

2. Acentra sp.?—The two largest specimens I have, both obtained from Vienna through the kindness of Dr. Zerny, of which the colour is light grey and without markings. The wing measurement 17mm. Case, stouter, not much longer.

3. Acentra sp.?—One specimen, intermediate in size between No. 1 and No. 2 is of a very pale grey colour and markingless. It is also from the Vienna neighbourhood. The wing measurement 12mm.

4. Acentra sp. ?—Two specimens (one, body gummed on and therefore doubtful) slightly larger than No. 1 and of the pure coloration of number 1. The reliable example is from Digne. The wing measurement 11mm. Case, very short, somewhat stout, but sharply pointed.

The differentiation of these four suggested species is supported by the evidence of the genitalia. But the material at present is quite insufficient to justify bestowing a specific name. These all belong to the "Fumea form" group in my Resumé in the Ent. Record, XXXV., p. 133, the sacculus is V-shaped and not hooked, the 7th emarginate.

Brachypterous Earwigs. A Problem for Field Workers.

By MALCOLM BURR, D.Sc., F.E.S.

A short time ago Mr. E. E. Green sent me a few earwigs which he had taken under boulders at Kyrenia in Cyprus. They were Forficula lurida, Fisch., and the sight of them recalled old memories, more particularly of one nice problem still waiting to be solved, which I will put forward now once more, in the hope that entomologists in the field may solve it during the summer. I called attention to the point in the Ent. Mo. Mag. twenty-five years ago, but without result.

The common earwig, F. auricularia, L., has the pronotum rounded at the hinder angle, which is correlated with the development of wings. In brachyterous forms the pronotum is rectangular. The forceps of the male are broadened near the base and this dilated part ends in a strong tooth. It ranges all over Europe and Africa and half way

across Asia.

In the Mediterranean area it is replaced by very closely related species in which the tooth at the end of the dilated part of the male forceps is absent. This seems but a trifling feature, yet is very constant, and I have never known this tooth absent from any other area. It really does seem to be a permanent specific character. In the eastern portion of the Mediterranean, the species is normally fully winged; this is F. lurida, the species sent me from Cyprus by Mr. Green. In the western half, it is normally brachypterous, and is then known as F. decipiens, Géné. This form reaches the Levant, though the lurida form seems dominant there.

Now in Calabria there is another form, brachypterous like F. decipiens, but with a marked tooth on the forceps, like F. auricularia. In fact, it differs from F. auricularia only in having the wings shortened with the pronotum more square, and the hinder border of the elytra rounded, both features correlative with the shortening of the wings. It is in fact, to my mind, not a distinct species but a brachypterous F. auricularia, just as F. dicipiens is a brachypterous F. lurida. As in the true Orthoptera and many Rynchota, brachypterous and macropterous forms of a single species are by no means rare.

Now we are coming to the point. In 1903, collecting on the south coast of the Isle of Wight, I casually turned over a cowpat. In channels in it I caught sight of two earwigs. There was something odd about their appearance that made me look a second time. They were brachypterous! To my mind that cowpat became classical. It stimulated me into quotation, as Mr. Donisthorpe may remember,

"Thou odoriferous stench! Sound rottenness!"

King John, Act III. Scene 4.

They were nothing like F. lesnei, common enough along the south coast, which is normally if not always brachypterous, but indistinguishable from the common or garden earwig, F. auricularia, a brachypterous form of which had not hitherto been recorded.

Now comes the fly in the ointment. They were both females. That means, that there were no means of saying whether they are F. decipiens, hitherto regarded as a purely Mediterranean form, or brachypterous specimens of true F. auricularia. I hunted in vain, but did not find a brachypterous male.

It seems very probable that they were brachypterous F. auricularia, and perhaps their own brothers and sisters were as macropterous as any normal earwig, but it is very desirable that the male be found.

It is a strange thing that the only ones recorded previously were from Calabria, to which two specific names have been given, F. targionii, Br., and F. silana, Costa, neither of which can stand, in my opinion, as they are nothing more or less than brachypterous specimens of F. auricularia. Brachypterism in this common and abundant species, therefore, is so very rare that it has been recorded only in these instances.

Everybody knows where earwigs are to be found, so I hope all friends in the field, especially Coleopterists, will have a second look at any earwigs they may see, and save them if they come across any brachypterous specimens.

A Holiday at Braemar.

By E. A. COCKAYNE, D.M., F.R.C.P.

I decided to spend my holiday in 1931 at Braemar to try to find the larvae of some species I have not yet seen, especially that of Mr. Russell James very kindly marked my maps Znuaena exulans. for me and gave me many useful hints derived from his experiences in 1911 and 1912. I arrived on June 3rd, and found that there had been a heavy fall of snow on the hills during the night and there was another on June 6th, which covered the exulans ground. During the first part of my stay clouds enveloped the hill tops almost continuously and the weather was cold as well as wet, so that I had only one opportunity of looking for larvae of exulans and that was a failure. On June 16th however I found a few young larvae before I was caught in a heavy thunderstorm and on the next day saw about eighty larvae and a few cocoons, and two full grown larvae. I was unlucky because in several of the cocoons there were larvae, which had not pupated. Later I climbed the mountain three or four times and found more larvae and cocoons, and as very little has been written about the habits of the insect in its early stages in Scotland I will give a general account of my observations. The larvae seen were, I think, in four different instars; two in the last were a rich velvety black with rather large yellow lateral spots; the great majority were about half the size of the full grown ones, with a uniform ground colour of a less intense black and with a lateral row of smaller yellow spots, but if one may judge by the size of their heads two instars were represented amongst them.

A number of much smaller larvae were found, 6mm. long, and the ground colour of these was greyish green, the green tint being due to the green fat under the skin. On each somite above and in front of the yellow lateral spot was a smaller black spot. In a blown larva it can be seen that this black spot is still present even in the last instar, but in the living larva the blackness of the ground colour hides it. A few larvae still smaller, 3.5 to 4mm. long, were found, and in these

the ground colour was paler greenish grey and the lateral yellow and black spots were more conspicuous. An attempt was made to blow larvae in each instar, but with the smallest it failed, though in one case it disclosed the presence of a parasite almost completely filling the larval skin. Other small larvae however had no parasites and their size was not due to this cause.

Larvae were found on two widely separated parts of the mountain summits so far apart that they have received different names on the ordnance survey map. Almost all were on the barer patches covered with lichen, a short growth of crowberry, Empetrum nigrum, and scattered plants of other species including heather, but the patches of longer heather round them were avoided. Larvae were seen feeding and moving about actively in the sunshine, eating the terminal buds of crowberry and in one case an unripe berry, which was hollowed out. Two were seen eating Vaccinium vitis-idaea, one Vaccinium myrtillus, and one heather. There was no Loiseleuria procumbens, the azalea, on the part where they were most plentiful, and in the other place I saw no larvae on the azalea, though doubtless the statement that it is one of their food-plants is correct. Of more than two hundred larvae seen all except the four already mentioned were on crowberry, and there is no doubt that this is the staple food at Braemar.

On June 26th larvae were very much scarcer and most of those I was keeping had stopped feeding. I suspected that they were beginning to hibernate. To confirm this I examined some of each instar and found that their intestines were empty and they contained little but rich emerald green fat and orange blood. This applied equally to the larger black and the smaller greyer larvae. After resting for a time they changed skin, and some I sent to Mr. C. N. Hawkins remained inactive and without feeding until winter had come, and one of them lived until the spring. This larva, one of the larger grey ones, changed skin at the end of May, but was very little bigger than before. I think that the two larger sizes of black larvae, which were so common, really represent larvae of two different years, and probably the two sizes of grever larvae also represent two different years. If so the insect passes at least five winters in the larval state, and only feeds for a short time each spring. It seems most remarkable that it should spend the warmest part of the year, July, August and September, in a state of suspended animation and feed at a time when snow may fall any night and cover the ground it lives on.

The larvae are by no means easy to see even when they are resting fully exposed, for the black ground colour blends well with the dark foliage of the crowberry and the yellow spots closely simulate the pale tips of the small fleshy leaves.

Of cocoons containing either a larva or a pupa I found about a hundred and sixty and about twenty with a hole in the side, and either empty or with a pupa, of which the abdomen and thorax had been partly eaten. Possibly the enemy was Carabus violaceus, which was rather common. Most of the pupae were well concealed and almost always attached to the underside of a stem of crowberry or less often a bit of dead heather or reindeer moss. A few were very conspicuously placed on a long piece of living or dead heather at the edge of one of the barer patches on which they had fed. I discovered that it was

much easier to find cocoons by passing my hand lightly over the crowberry and listening for the dry rustling sound made when I touched one than by looking for them, though a rather similar sound was made by a dry blackish lichen. The cocoons are very fragile and so loosely attached that they fall off at a touch. There were seldom more than one or two on a plant or group of plants, though once I found one fastened on to the top of another.

Almost all the moths emerged between July 1st and 6th and the few remaining ones appeared between the 6th and 10th. Emergence took place at any hour from early morning to late at night, though

most of them emerged during the hours of day light.

Beating for larvae of *Gnophos myrtillata* produced a single dead one, which had been sucked by a bug, and searching for them at night gave little better success, though I did find two, both sitting with the body almost at right angles to the food-plant rigid and motionless. The larva is remarkably short and stout for a geometer and of a soft grey colour. Larvae of *Plusia interrogationis* were widely spread over the moors and I found one or two, nearly every day, but never more than six. They were always resting high up on a sprig of heather, both by day and by night, in rain or in sunshine. A high percentage were however parasitized by a species of *Apanteles* which killed them before they were more than three-quarters grown. Beating nettles gave me sixteen larvae of *Plusia pulchrina*, but these were parasitized by another *Apanteles*, which killed them, when they were full-fed.

Larvae of Lygris pyraliata were common and were easy to see by day at rest on Galium verum growing on the banks along the roadside or between the fields. Those of Lygris populata were abundant in a birch wood on the bilberry, but green forms were rare. The moths were very variable, from typical ones to the darkest chocolate forms.

and one female had a white instead of a yellow ground colour.

Larvae of Noctua castanea were common and the moths bred were very variable, grey, pink, red of several shades, and dark brown. Larvae and cocoons of Dasychira fascelina were widely distributed on the low ground, and there were many small larvae all of which were parasitized. The parasite spins its cocoon under the abdomen of the larvae, so that it is almost impossible to distinguish a dead larva from a living one. On the junipers larvae of Thera simulata and Eupithecia sobrinata were abundant, and the imagines of the latter emerged from July 6th to 21st. On Pinus sylvestris there were a few larvae of Thera obeliscata, but those of T. firmata were much commoner. Unfortunately the larvae of all the Theras were heavily parasitized by a Proctotrypid.

On a series of low rock-capped hills some miles down the valley there is an abundant growth of bearberry and a visit on one of the few sunny days, June 18th, was very successful. Isturgia carbonaria was common but worn, and males were flying freely between 11.80 and 1.30 summer time. Females were found at rest or disturbed from the bearberry and eggs were obtained and the larvae brought to maturity later in the season. Anarta cordigera was still on the wing

here and in Glen Callater.

Carbonaria was also seen on Meall an t-Slugain. A single female of Epirrhoë tristata was taken between the pine wood and the burn

that rises on Meikle Elrick, and from the ova obtained larvae were

brought to full growth, but died of some infectious disease.

Calostigia salicata was first found on June 5th, but was much commoner later on the large lime stone rocks up Glen Callater. Eggs were laid on the tips of moss and the larvae fed up well on Galium.

Anarta melanopa, though in poor condition remained fairly common up to the end of my visit, June 30th, but all my friends failed to rear larvae, though they were sleeved on sallow out of doors or fed on growing plants. Mr. Lees, who did better than anyone else, kindly let me have the full-fed larva for preservation, but failed to get a single pupa. We have had the same experience with this larva before and it seems to be very delicate, when it is removed from its natural habitat

Two nights' sugaring produced a nice series of *Hadena rectilinea* and I distributed eggs to a few friends. The moth comes very punctually at 11.45 p.m. summer time.

I had hoped to get eggs of Psodos trepidaria, but the moth was

late, and I only took two males just before I left Braemar.

The weather was cold and wet almost every day, but whatever the weather may be at Braemar the sight of interesting local plants such as Cornus succious, Betula nana, and Thalictrum alpinum and the beauty of the scene from the hill-tops, from which one sees mountain crest upon mountain crest, many with huge snow-drifts under the higher ledges and in the deep gullies, compensates one for one's failures.

On the "Illustrations of European Butterflies" by S. L. Mosley (1879-1894).

By CHARLES MOSLEY, M.B.O.U.

(Curator of The City of Wakefield Museum and Art Gallery.)

Following the example of Mr. Francis J. Griffin, who, in the 'Entomologist's Record 'of November last, itemised the contents of the "Illustrations of Varieties of British Lepidoptera," it may be of equal interest to treat similarly another of the early works by the same author, whose son I have the honour to be.

These works are probably unique, both in their inception and in their production. Until quite recently I had never seen complete copies of either of them; my father did not even keep one for himself, hence it was a delight to be able to pick up perfect copies from a second-hand

bookseller even though incomplete.

The "Illustrations of European Butterflies" was issued "for private circulation to subscribers only," this fact being inscribed in the author's handwriting on the covers of the earlier parts; later it was printed thereon. The copy at present under review was subscribed for by a "Mr. Sidebotham" from whose library it came into the market, probably at his death. It is evident that a stock of covers were printed and used for the several parts as issued until exhausted, certain details filled in in ink as may be appropriate in each case. The script and printing on the front cover is as follows:

For private circulation to subscribers only.

Science and Fine Art.

Illustrations of

BUTTERFLIES: EUROPEAN

A Series of Hand-painted Figures,

S. L. MOSLEY.

To be had of S. L. Mosley, Primrose Hill, Huddersfield.

The cover only contains matter on its front page. The size of the work is 10½ ins. by 7 ins., and each part is priced at 5/- post free. In the earlier parts the plates are entirely hand-produced throughout, but later, the hand-colouring has been imposed upon a black lithographed outline, which in turn was dropped in the concluding parts. nearly two years the parts appeared regularly once per month, afterwards at irregular intervals, until finally completed in 1894. Each plate is overlaid with white tissue paper and the plates constituting a part are thread-stitched together before being gummed into the cover. There is no text, the plates are not numbered, but the species figured are numbered consecutively although they do not appear in regular order in the parts. The following are the detailed contents of each respective part available, preceded by the inscription on each cover (partly in MS. and in print) :-

Part I., January, 1879. Containing 4 Plates (9 figures). Representing 6 species.

First plate: 1. Papilio podalirius, Linn. One figure. 2. Papilio alexanor, Esp. One figure.

3. Papilio machaon, Linn. One figure, with Second plate: larva and pupa on plant of water Drop-

Third plate: 4. Papilio hospiton, Gene. One figure.

5. Thais cerisyi, Godt. One figure.

Fourth plate: 6. Thais polyxena, W.V. Two figures (upper and under sides).

Part II., February, 1879. Containing 4 plates (10 figures). Representing 6 Species.

First plate: 7. Thais rumina, Linn. One figure.

Second plate:

8. Doritis apollinus, Herbst. One figure. 9. Parnassius apollo, Linn. One figure.

10. Parnassius phoebus, Hub. 1795; delius, Esp.

1800. One figure. 14. Pieris brassicae, Linn. Four figures (male

Third plate: and under side, female, and larva) on spray of Tropaeolum.

Two figures (upper Fourth plate: 15. Pieris krueperi, Stg. and under sides).

Part III., March, 1879. Containing 4 Plates (13 figures). Representing 4 Species.

16. Pieris rapae, Linn. Five figures (male and First plate: under side, female, larva, and pupa), on sprays of Mignonette and grass.

Second plate: 18. Pieris callidice, Esp. Three figures (male

and under side, and female).

Third plate: 20. Pieris chloridice, Hub. Three figures (male and under side, and female), with spray of Hairbell.

Fourth plate: 21. Anthocharis belemia, Esp. Two figures (upper and under sides).

Containing 4 Plates (12 Figures). Representing Part IV., April, 1879. 4 Species.

Two figures (upper First plate: 22. Anthocharis belia, Esp.

and under sides).

Second plate: 23. Anthocharis tagis, Hub. Two figures (upper and under sides).

Third plate: 24. Anthocharis cardamines, Linn. Five figures (male and under side, female, larva, and pupa) and sprig of Lady's Smock.

Fourth plate: 25. Anthocharis gruneri, H.S. Three figures (male and under side, and female).

Part V., May, 1879. Containing 4 Plates (12 Figures). Representing 4 Species.

19. Pieris daplidice, Linn. Five figures (male First plate: and under side, female, larva, and pupa) with plant of Mignonette.

Second plate: 27. Anthocharis eupheno, Linn. Three figures (male, female and under side).

Third plate: 29. Zegris eupheme, Esp. Two figures (upper and under sides).

31. Leucophasia lathyri, Hub. Two Fourth plate: (upper and under sides) with spray of Vetch.

Part VI., June, 1879. Containing 4 plates (14 Figures). Representing 4 species.

First plate: 32. Colias palaeno, Linn. Three figures (male and under side, and female).

33. Colias phicomone, Esp. Three figures (male Second plate: and under side, and female).

Third plate: 33a. Colias nastes, Boisd., variety phicomone? Three figures (male, female and under side).

40. Colias edusa, Fab. Five figures (male and Fourth plate: under side, female, larva, and pupa), on spray of Clover leaves.

Part VII., July, 1879. Containing 4 Plates (11 Figures). Representing 4 Species.

First plate: 35. Colias erate, Esp. Three figures (male, female and under side).

Second plate: 39. Colias myrmidone, Esp. Three figures (male and under side, and female).

Third plate: 42. Colias aurorina, H.S. Three figures (male and under side. and female) with spray of Speedwell.

44. Gonepteryx cleopatra, Linn. Two figures Fourth plate: (male and female).

Part VIII., August, 1879. Containing 5 Plates (11 Figures). Representing 5 Species.

First plate: 26. Anthocharis damone, Boisd. Three figures (male and under side, and female).

28. Zegris pyrothoe, Esp. Two figures (upper Second plate: and under sides).

Third plate: 36. Colias chrysotheme, Esp. Two figures (male and female).

Fourth plate: 37. Colias hecla, Le.; boothii, Bd. Two figures (male and female).

41. Colias heldreichi, St. Two figures (male Fifth plate: and female).

Containing 6 Plates (12 Figures). Repre-Part IX., September, 1879. senting 6 Species.

First plate: 36a. Colias boothii, Curt. Two figures (male and female).

84. Argynnis leodice, Ps. Two figures (upper Second plate: and under sides).

92. Vanessa v-album, W.V., 1776; L-album, Esp., Third plate: 1780.Two figures (upper and under sides).

99. Neptis aceris, Fab. Two figures (upper and Fourth plate: under sides).

100. Neptis lucilla, W.V. Two figures (upper Fifth plate: and under sides).

Sixth plate: 108. Melitaea lachesis, Hub. Two figures (upper and under sides).

Part X., October, 1879. Containing 4 plates (16 Figures). Representing 4 Species.

34. Colias hyale, Linn. Four figures (male and First plate: under side, pale form of female, and larva) with bunch of Dutch Clover and grass.

43. Gonepteryx rhamni, Linn. Four figures Second plate: (male, female, larva, and pupa) with sprig of Buckthorn.

51. Melitaea cinxia, Linn. Four figures (upper Third plate: and under sides, larva, and pupa) with Ribwort Plantain.

Fourth plate: 93. Vanessa urticae, Linn. Four figures (upper and under sides, larva, and pupa) on Nettle.

Part XI., November, 1879. Containing 4 Plates (9 Figures). Representing 4 Species.

chrysippus, Linn. First plate: 45. Danais Two figures (upper and under sides).

Second plate: 102. Limenitis camilla, W.V. Two figures (upper and under sides).

Third plate: 105. Apatura ilia, W.V. Three figures (upper and under sides, and variety clytie, Hub.).

Fourth plate: 106. Charaxes jasius, Fab. Two figures (upper and under sides).

Part XII., December 1879. Containing 7 Plates (14 Figures). Representing 7 Species.

First plate: 113. Melitaea syllius, Host., 1794; psyche, Hub. 1825. Two figures (upper and under sides).

Second plate: 116. Melitaea thetis, Hub., 1795? ines, Hoff., 1804.
Two figures (upper and under sides).

Third plate: 123. Lasionmata dejanira, Linn. Two figures (upper and under sides).

Fourth plate: 126. Satyrus alcyone, W.V. Two figures (upper and under sides).

Fifth plate: 127. Satyrus briseis, Linn. Two figures (upper and under sides).

Sixth plate: 128. Satyrus anthe, Boisd. Two figures (upper and under sides).

Seventh plate: 138. Satyrus fidia, Linn. Two figures (upper and under sides).

Part XIII., January, 1880. Containing 4 Plates (12 Figures). Representing 4 Species.

First plate: 119. Lasionmata maera, Linn. Three figures (male and under side, and female).

Second plate: 139. Satyrus dryas, Sc., 1763; phaedra, Linn., 1764. Three figures (male, female and under side).

Third plate: 140. Satyrus cordula, Fab., variety of actaea?

Three figures (male under side, female and under side).

Fourth plate: 148. Satyrus ida, Stg. Three figures (male, female and under side).

Part XIV., February, 1880. Containing 5 Plates (11 Figures). Representing 5 Species.

First plate: 48. Melitaea maturna, Linn. Two figures (upper and under sides).

Second plate: 53. Melitaea phoebe, Fab. Two figures (upper and under sides).

Third plate: 55. Melitaea trivia, W.V. Two figures (upper and under sides).

Fourth plate: 76. Argynnis hecate, W.V. Two figures (upper and under sides).

Fifth plate: 82. Argynnis niobe, Linn. Three figures (upper and under sides, and under side of variety eris, Meig.).

Part XV., March, 1880. Containing 5 Plates (11 Figures). Representing 5 Species.

First plate: 185. Erebia medusa, W.V. Two figures (upper and under sides).

Second plate: 190. Erebia alecto, Hub. Three figures (male and under side, female under side).

Third plate: 192. Erebia stygne, Hub.; epistygne, Bd. Two figures (upper and under sides).

Fourth plate: 193. Erebia afra, Esp. Two figures (upper and under sides).

Fifth plate: 203. Erebia neoridas, Bdy. Two figures (upper and under sides).

Part XVI., April, 1880. Containing 5 Plates (11 Figures). Representing 5 Species.

First plate: 177. Erebia melampus, Fuessly. Two figures (upper and under sides).

Second plate: 182. Erebia pyrrha, W.V., 1776; manto, Esp., 1781?Three figures (male and under side, female under side).

Third plate: 183. Erebio ceto, Hub. Two figures (upper and under sides).

Fourth plate: 188. Erebia erias, Lefe. Two figures (upper and under sides).

Fifth plate: 195. Erebia manto, W.V., 1776; lappona, Thunb., Two figures (upper and under 1791.sides).

Containing 4 plates (10 figures). Represent-Part XVII., May 1880. ing 4 Species.

135. Satyrus iolaus, Bonelli; neomiris, Bdv. Two First plate: figures (upper and under sides).

Second Plate: 136. Satyrus arethusa, W.V. Three figures (upper and under sides, and under side of variety erythia, Hub.).

209. Libythea celtis, Fuessly. Two figures (upper Third plate: and under sides) with tiny spray of Speedwell.

Fourth plate: 221. Thestor ballus, Fab. Three figures (male. female and under side) with spray of Vetch.

Part XVIII., June, 1880. Containing 4 plates (12 figures). Representing 4 Species.

First plate: 234. Lycaena baeticus, Linn. Three figures (male, female and under side).

Second Plate: 268. Lycaena dorylas, W.V. Three figures (male and under side, and female).

Third plate: 270. Lycaena admetus, Esp. Three figures (male and under side, and female).

Fourth plate: 284. Lycaena cyllarus, Rottg. Three figures (male, female and under side).

Part XIX., July, 1880. Containing 4 plates (12 figures). Representing 4 Species.

First plate: 225. Polyommatus thersamon, Esp. Three figures (male, female and under side).

Second plate: 226. Polyommatus hippothoe, W.V. Three figures (male, female and under side) with spray of Sorrel.

Third plate: 227. Polyommatus hippothoe, Linn., 1761; eurydice, Rott., 1775; chryseis, W.V., 1776. Three

figures (male and under side, and female)

with small spray of Sorrel.
Fourth plate: 228. Polyommatus alciphron, Rott. Three

Polyonmatus alciphron, Rott. Three figures (male, female and under side) with spray

of Sorrel.

At this period the author changes his address, and subsequent parts are issued from Woodside Road, Beaumont Park, Huddersfield, instead of Primrose Hill.

Part XX., August, 1880. Containing 4 plates (19 figures). Representing 4 Species.

First plate: 94. Vannessa io, Linn. Four figures (upper and under sides, larva and pupa) on Nettle.

Second plate: 122. Satyrus aegeria, Linn. Five figures (upper and under side, variety meone, Hb., larva,

and pupa) on tuft of grass.

Third plate: 130. Satyrus semele, Linn. Five figures (male and under side, female, larva, and pupa) on tuft of grass.

Fourth plate: 149. Satyrus tithonus, Linn. Five figures (male, female and under side, larva, and pupa) on grass stems.

Part XXI., September 1880. Containing 4 plates (15 figures). Representing 4 Species.

First plate: 77. Argynnis lathonia, Linn. Two figures (upper and under sides).

Second plate: 96. Pyrameis atalanta, Linn. Four figures (upper and under sides, larva, and pupa) on Nettle.

Third plate: 145. Satyrus janira, Linn. Five figures (male, female and under side, larva, and pupa) on tuft of grass.

Fourth plate: 204. Erebia medea, W.V., 1776; blandina, Fab., 1787. Four figures (sexes not marked, presumable male and under side, female under side, and larva) on grass stems.

Part 22, October, 1880. Containing 4 Plates (22 Figures). Representing 8 Species.

First plate: 312. Hesperia thaumas, Hufn., 1775; linea, W.V., 1776. Three figures (male and under side, and female.)

313. Hesperia lineola, Och. Three figures (male and under side, and female).

Second plate: 314. Hesperia actaeon, Rott. Four figures (male and under side, female, and larva) on tuft of grass.

Third plate: 315. Hesperia sylvanus, Esp. Three figures (male, female and under side).

316. Hesperia comma, Linn. Three figures (male female and under side) with spray of grass.

319. Cyclopides morpheus, Pall., 1776; steropes, Fourth plate: W.V., 1776. Two figures (upper and under sides).

> 320. Cyclopides palaemon, Pall., 1771; paniscus, Two figures (upper and Fab., 1775. under sides).

> 321. Cyclopides sylvius, Knoch. Two figures (upper and under sides).

Part XXIII., November, 1880. Containing 4 Plates (12 Figures). Representing 4 Species.

First plate: 253. Lycaena pheretes, Hub. Three figures (male

and under side, and female).

254. Lycaena orbitulus, Stg. Three figures (male Second plate: and under side, and female).

Third plate: 262. Lycaena chiron, Rott., 1775; eumedon, Esp., Three figures (male and under 1760.side, and female).

281. Lycaena semiargus, Rott., 1775; acis, W.V., Fourth plate: 1776. Three figures (male and under side, and female).

Part XXIV., 1881. Containing 4 Plates (16 Figures). Representing 4 Species.

First plate: 13. Aporia crataegi, Linn. Three figures (upper side, larva, and pupa) on sprig of Hawthorn.

Second plate: 89. Grapta c-album, Linn. Six figures (upper and under sides of the ordinary form and spring brood, larva, and pupa) on sprig of Red Currant in fruit.

95. Vanessa antiopa, Linn. Three figures (upper Third plate: and under sides, and larva) on sprig of Willow.

Fourth plate: 232. Polyommatus phlaeas, Linn. Four figures (upper and under sides, larva, and pupa) on plant of Sheep's Sorrel.

Part XXV., 1882. Containing 4 Plates (13 Figures). Representing 4 Species.

30. Leucophasia sinapis, Linn. Three figures First plate: (two upper sides—male and female?—and larva) on plant of Vetch.

Second plate: 65. Argynnis euphrosyne, Linn. Three figures (upper and under sides, and larva) on plant of Dog Violet.

Third plate: 85. Argynnis paphia, Linn. Four figures (male, female, and an under side, and larva) on Dog Violet.

107. Melanagria (surely intended for Melanarge?) Fourth plate: galathea, Linn. Three figures (upper side, and two forms of the larva) on grass stems.

Part 26, 1882. Containing 5 Plates (13 Figures). Representing 5 Species.

First plate: 12. Parnassius mnemosyne, Linn. One figure. Second plate: 161. Coenonympha dorus, Esp. Three figures (male, female, and an under side).

Third plate: 248. Lycaena baton, Bg.; hylas, Hub. Three figures (male, female, and an under side).

Fourth plate: 285. Lycaena melanops, Bdv. Three figures (male, female, and an under side).

Fifth plate: 286. Lycaena iolas, Och. Three figures (male, female, and an under side).

Part XXVII., 1882. Containing 4 plates (11 Figures). Representing 5 Species.

First plate: 64. Argynnis selene, W.V. Two figures (upper and under sides) with plant of Dog Violet.

Second plate: 117. Lasionmata roxélana, Cr. Two figures (upper and under sides).

Third plate: 288. Lycaena diomedes, Rg.; euphemus, Hb.
Three figures (male, female, and an under

Fourth plate: 294. Pyrgus proto, Esp. Two figures (upper and under sides).

308. Pyrgus sao, Hub. Two figures (upper and under sides).

(To be concluded.)

The Geographical Variations of Boloria euphrosyne, L.

By ROGER VERITY, M.D.

To discuss generic names and to come to definite conclusions about their proper use, according to Nomenclatorial Rules, seems nearly to be a hopeless undertaking, because the old names have been erected and subsequently used, in some cases, so vaguely and so differently from what modern rules require that their position can be viewed from different standpoints and different results reached. Nothing but a final verdict by an international commission can in such circumstances fix their use

by aformal act, to be accepted without further discussion.

In the present one Frühstorfer has well summarised the unfortunate history of the names Brenthis, Hüb., and Boloria, Moore, in Seitz's Fauna Indo-Australica, p. 512, and his conclusion is that the first is nothing but a synonym of Argynnis and the second must be used for the sharply defined genus, with only one subcostal nervule rising before the apex of the cell of the forewing, whereas in the Argynnis two are invariably given forth. According to this definition, out of the species included by Staudinger in his Catalog of 1901, those numbered 202 to 220 are Boloria and to these are to be added eugenia, Er., which is wrongly placed there after A. daphne, and the purely Indian jerdoni, Lang, as well as several American species.

I thus use the name of *Boloria* for *euphrosyne*. It will be seen at the end of this paper that the distribution of this species all over Asia

Minor, as far as Armenia, and other facts, such as the two extremely different aspects it exhibits, corresponding to those of other species in their Northern and Central exerge, seem to show the way enphrosyne reached Europe a first time with the Miocene migration by the Hyrcanian isthmus and the Central route and a second time, after the Glacial Epoch, by the Northern, Siberian, one. It also appears that the first of these stocks spread northward, after this Epoch, to central Europe and England, together with species purely Mediterranean in origin, such as N. statilinus, H. briseis, A. coridon. What, apparently shows it is that in central Europe and in England one meets, locally and individually, with a remarkable extent of variation, distinctly covering the features of both the Northern and the Central exerges of euphrosyne, although it does not reach their culminating degrees, in either case.

The Central exerge, which should be called apennina, Stdgr., as this is the first race described and it also happens to be the most highly characterised one, exhibits the following features when taken as a whole: Size larger in some cases than it ever is in the Northern exerge, but often quite as small; tone of fulvous brighter, clearer and warmer; underside of hindwings of a bright, clear, orange colour and very much more uniform, in that darker shadings are scarcely perceptible; black pattern of both surfaces very reduced and sharp in outline: thus, there is no basal shading or it is very limited and not very dark; the two outer rows of spots are notably small and the marginal one is often reduced, especially in race apennina, to mere specks; some of these spots are often entirely missing on the underside, towards the apex of the forewing, and the others, on these wings, are small and nale.

The Northern exerge, to which belongs the specimen labelled by Linneus, preserved at Burlington House, and those I have received from Southern Sweden, and which should, hence, be called euphrosyne, L., is characterised as follows: Constantly small size; tone of colour dull and pale, but in some of the more extreme northern and alpine races, occasionally, of a rich chestnut tinge; underside of hindwing more or less extensively shaded and patched with russet, which may be of a bright tone or, in extreme northern and alpine races, considerably deep in tone; the black pattern is much more extensive on both surfaces than in the preceding exerge, including a broad and deep black basal suffusion, more prominent in the female than in the male; the sexual dimorphism is more accentuated here than in the other exerge also in other respects, such as by the more variegated

and variable tone of fulvous of the female.

Frühstorfer has already remarked that race neston, described by him from Mt. Generoso in southern Tessin, is a near approach to apennina. I can confirm this on the strength of the large series I have collected at Pian Quaggiè, 900m., above Intra, on Lake Maggiore, at the beginning of June, and higher up, at the Passo di Colle, 1450m., at the end of that month. The few specimens I have from Oulx, at 1000 to 1200m. in the Cottian Alps, seem to belong to the same race and thus agree with other species, which very much resemble, there, the races of the Apennines, as I have already pointed out. Also my series from the Baths of Valdieri, 1500m., in the Maritime Alps, comes very close to neston, although they may point more than the Oulx ones to race

densoi, Frühst.; the latter is described from Champéry (Dent du Midi) as being similar to neston, but larger, with more elongated wings and with a remarkably broad yellow band across the underside of the hindwing. I take neston to be the broadspread race in the more dry and warm valleys of the Alps, whereas, on the northern watershed, the Central exerge loses, in some localities, its vivid colouring and acquires the pale, washed-out appearance described on both surfaces of race cynosoma, Frühst., from the Salève, near Geneva, and compared by its author with luciflua of M. athalia and with leonina of B. dia of the same region.

As a rule, however, the Central exerge, spreading northward, has in no way become debilitated, evidently owing to the fact that also in the Central Zone it keeps to the mountains and it is one of the very first species to emerge there, in the spring, so that the difference of constitution between the two exerges seems due to transformation and debilitation of the Northern one, as the result of the extremely cold and damp regions and epochs it has lived in, since it has separated, very anciently, from the Central stock in Asia; this agrees with the general rule of the origin of palaearctic exerges and species from tropical ones.

As a matter of fact, there is a broadspread form, often showing no signs of intermixture with the Northern exerge, locally, and thus constituting a distinct race from it, which spreads from Berlin and England to the rest of Germany and to the whole of France (I possess it from as far west as Amboise and the Gironde, at Saint Laurent d'Arce) and which differs, on the whole, in no way from my series of specimens of race neston from the Tessin, so that this name should be extended to it. Exceptions are afforded here and there, by an increase in the range of individual variation, evidently due to crossings with the Northern exerge, precisely as in the case of M. didyma in about the same broad area of Central Europe. Sometimes an exception occurs also in connection with the tone of colour, which is much paler and more yellowish than in true neston, and Frühstorfer remarks, in the Int. Entom. Zeit., 1907, p. 164, that it is a racial feature in the neighbourhood of Berlin: it may be useful to designate it by the name of nestonclara.

Finally, I must note that Calberla and Staudinger give: "minor," as a characteristic of race apennina, Stdgr., but that this is not correct, if it be compared with nominotypical euphrosyne of Sweden; on the other hand, they are both small if compared with neston and the other lowland races of Central Europe, but the average apennina is not as small as the Swedish examples; this point must be made clear and it must, furthermore, be added that in some localities of the Apennines, such as Vallombrosa, in the province of Florence, apennina is larger than usual and quite the size of neston and that on the northern, Po, watershed of the northern Apennines there exists at low altitudes a strikingly large race, some specimens of which from Mount Gibbio 400 m., in the province of Modena, are actually the largest euphrosyne I have seen from any locality; the length of the forewing, from base to tip, reaches 25 mm. in both sexes, against the 20 to 22 of the largest neston of Central Europe. This race is rendered truly magnificent also by its extremely vivid, warm and clear fulvous tinge and by its bright orange underside; the black markings are as reduced as in apennina

and even more so, the marginal ones of the forewing often being entirely obliterated; it is well worthy of the name, I suggest for it, of

padimira.

Passing, now, to the races of the northern exerge, as defined above. we first find one, which, by its large size and general appearance, gives one the impression of being somewhat intermediate between the two exerges and, possibly, a synexerge produced by the crossing of the two strains: in size it is similar to the largest neston (20 to 22 mm.) and a few individuals recall the latter also by the orange tone of the underside of the hindwing, but, as a rule, this colour is replaced by the darker and redder russet one, which characterises the northern exerge, and also the black markings of both surfaces are, as in the latter, very extensive, including, on the upperside, a broad and dark basal suffusion and a broad marginal band or large spots, only just falling short of blending together; the fulvous is usually duller than in neston. series of examples of this form is from Gédre, in the Hautes Pyrénées, and from the Caralps of Catalonia, at 1400 m.; one can presume it reached the Pyrenees from the Alps and that it had got there amongst the early alpine, species, which came, along the outskirts of the icesheet, from Siberia, when the glacial period was coming to an end; as a matter of fact, a single specimen I possess from the Ural Mountains is perfectly identical with some of my Pyrenean ones. distinct form and race I propose calling, by a descriptive name eminens for this reason and also because Hübner gives (figs. 28-30) excellent figures of a couple, which, according to all probabilities, was German, so that it will, no doubt, turn out to exist in many localities of Central Europe and Russia, where the climate has been more favourable to the Northern exerge than to the Central one and eminens has had the upperhand on neston.

The next race to consider is the nominotypical one, I have already mentioned, decidedly smaller (male: 18 to 20 and female occasionally 21mm.) and duller in colour than eminens and neston; it is well, though roughly, figured by Esper on plate 18, and it contrasts with his neston, from the south of France, of plate 72. This form is probably the only one found in southern Sweden and thence it spreads over the northern part of the area of neston (Northern Germany, Northern France and England), with which it is often found locally or individually, producing races which are evidently synexerges; for instance, I have a specimen amongst my nestonclara of Berlin and I have it from the Seine depart-Further south it disappears in the lowlands and it becomes the characteristic mountain race: I have, myself, collected it at Sappada, 1300m., in the Carnic Alps, in the cool, woody ravines of the Anzasca Valley, as low as 700m., and in the Cottian Alps, at Cesana, 1300m., and at Clavières, 1700m., and Sestrières, 2100m.; all these series are perfectly identical with the Swedish one from Scania, and correspond to the Linnean specimen. If anything, they tend to differ from them by being, on the whole, a little more melanic and the description of Frühstorfer of race calynda from Fusio, Val Piora, 1250m., in Tessin, sounds as though it applied to a further degree of variation in that direction: both surfaces are described as more melanic than in any other race he possessed, the basal suffusion being broad on the hindwing, the markings prominent, the underside of a dark reddish brown, the marginal silver spaces very large; the average size of the race is

said to be markedly larger than Geneva examples.

The same cannot be said of a pretty set I have from Birtley, in Durham: it is the smallest euphrosyne I have seen, the forewing of the males measuring from 16 to 19mm, and the females 18 to 20, and also being rather narrower from costa to tornus than in other races; the fulvous is rather brighter and clearer than in the Scania examples and the black pattern rather less pronounced, so that, on the upperside, it varies in the direction opposite to that of race fingal; on the underside, there is, on the contrary, an approach to the latter in the rich, red tone of the russet patches, but the chief peculiarity of this race is the way in which, on the hindwing, these patches stand out sharply on others of a pure yellow colour; in nominotypical euphrosyne these two colours blend much more into each other and in fingal the red covers nearly the entire space between the central yellow band and the premarginal lunules; here, instead, this space is strikingly variegated, and chequered, somewhat recalling its aspect in selene for which this race might, at first sight, be mistaken also on account of its small size and of the shape of the wings, mentioned above. I name it varianana.

Frühstorfer (l.c.), in connection with the nominotypical normal race from Sweden and Norway, says that "the small, pale specimens from Norway, with large black spots can be designated by the name of answina, if that of fingal does not cover them." It is difficult to settle this point without seeing his specimens and it is to be regretted he has not done so himself, before erecting a new name. The only remark one can make is that it does not seem to be equivalent to fingal, because it is "paler" whereas the latter is, on the contrary, of a much richer and redder tone of fulvous than nominotypical euphrosyne. It thus seems as though answina must be an extreme degenerate form of the Northern exerge, found in unfavourable local conditions, whereas fingal, Herbst, must be something more than an ordinary race and must posses a particular hereditary constitution, one might consider as that of an Arctic exerge, which thrives in the arctic region and on the outskirts of glaciers much better than does the Northern exerge in less glacial conditions. Its size is small (length of forewing about 20mm. in both sexes), and the shape of the wings is rounder at the apex, especially in the female; the colours are not bright, but strikingly more saturated than in any other emphrosyne and the underside is of a rich red tone; the black markings are much larger and the extreme form, in which they blend and blacken the greater part of the wings has been named obscurior by Seitz, who, figures it from Kuusamo, in Finland.

This insect has, by its peculiar aspect, struck entomologists from the outset: Esper thought it was a dia and named it lapponica, figuring it on pl. 108, but he had already applied this name to a specimen of freija on pl. 97, so that Herbst was right in erecting his name of fingal. Herrich-Schäffer, instead, overlooks it entirely, as he was apt to do, and figures it under the synonyum of nephele from a fully characterised specimen, which, in his description in the Supplement, p. 5, he says was from Lapland; Seitz is thus quite wrong in calling nephele a transitional race from Esthonia. I fear Ebert has only introduced a third synonym in nomenclature by naming alpina in the Iris, 40, p. 133, the race of the Alps of Algau from 1000

to 1600m. of altitude, for I can detect no difference between *fingal* and either his description or the specimens I have collected at Sulden, 1800m.. in the moraines of the great Ortler glaciers and it is well known that such races are often exactly similar to those of the arctic region. The name *alpina* would, besides, be a homonym of the B. dia called in the same way by Elwes in 1899.

(To be concluded.)

CURRENT NOTES AND SHORT NOTICES.

Again we wish to mention the travel and hotel arrangements for the forthcoming International Congress of Entomology to be held from July 16th to 23rd are in the hands of Messrs. Cook & Son, Ltd., Berkeley Street, London, W.C. The arrangements for the Post-Congress Tour to the Pyrenees July 24th to 30th, are also in the hands of Messrs. Cook & Son, Ltd.

May we again ask our readers to look out for immigrant species.

So far as we can hear Nomenclature is in the background altogether at the forthcoming Congress. The British Committee is apparently inactive, and one hears of no other national committee either functioning or even having been formed. We believe certain action was attempted at the Zoological Congress at Vienna, but complete ignorance on the matter prevails, and whether intentional or otherwise no report of what occurred (if anything) has been distributed. The lethargy, delay, procrastination on this most needed regulation is astounding. We are all left still to our own individual actions on nomenclatorial questions, and to the domination of jelly fish and stuffed elephants. Apropos of this question may we refer readers to the short note and the enlivening sketch accompanying it in the Bull. Brook. Ent. Socy. for February last, by our industrious correspondent J. D. Gunder of Pasadena, Calif., on "Kow-towing to the General Zoologist." In this Dr. E. N. Tom Ology is represented as doing homage to a chubby crowned kid labelled "zoologist" holding a book of "Rules from jellyfish to Elephants" having a toy elephant by his side and a "committee wand " in his hand.

Our note on stainless steel pins for insects in the last number (June) has elicited a letter from the well-known firm Watkins and Doncaster of 36 Strand, in which they write, "It may interest you to know that we have for some considerable time been carrying large stocks of stainless steel pins continental length in all guages. We also stock stainless steel pins in varying guages and lengths for microlepidoptera. As regards your remarks re the test of time, we have every confidence in recommending these pins as they have been subjected to every test that it has been possible to apply to them." The samples sent, so far as we can see, are quite good, and we note particularly no. 0124 for Tortrices and the average Tineid as being a most efficient pin. We might suggest that the very particular collector might cut the long pins to his own length with sharp pliers. No. 0 long makes an admirable micro pin when cut.

The Supplement to Vol. I of Seitz Macrolepidoptera of the World. Palaearctic Rhopalocera, has now been completed, and consists, including Index, etc., of more than 400 large quarto pages and 16 plates containing a very large number of supplementary figures. In the present

volume all the names of abnormal specimens, omitted from the main volume, such as those given by Tutt, have been included. In fact the Index contains the huge number of more than 9000 supplementary names in the Rhopalocera alone. The remarks on Nomenclature in the Preface are quite interesting. One reads "It is open to doubt whether such denominations as for instance a form croceo-semi-virgatuscaerulescens can be held to be valid for forms in accordance with Linné's nomenclature." Such as these are "abbreviated diagnoses." Of the 9000 names only 39 are entirely new. Reference is made to Courvoisier's attempt to introduce some consistency in the terms of denomination, e.g., privata for all forms with reduced markings or decorata for all forms with increased marking and so forth. Dr. Seitz, however, although he does not favour these schemes of nomenclature takes no stand on the question and leaves each reader to act on his own as to the use of such and other names. Although "race," as apart from "subspecies," is referred to, the author has declined to enter into any definite pronouncement on the question.

Progress is also being made in the Supplement to Volume II. of Seitz Pal. Lepid. (Bombyces, etc.) this having reached 16 sheets and and several additional plates. In the last part published, the British species included are Malacosoma neustria and M. castrensis, Lasiocampa quercus and L. trifolii, Macrothylacia rubi, Gastropacha quercifolia, etc.

Of the main volumes of Seitz, that on the American Fauna of the Bombycid Section is in a very forward state. At present the sheets 116-118 are reached and plates 90-95 are issued. These latter contain more than 100 excellent figures of Sphingidae of which the letterpress has already appeared.

The corresponding volume of the Indo-australica Fauna is also in a forward state having reached part 188 and plate 89 of the Bombyces section. It is very gratifying to note that in the present depressed state of world economics it has been possible to continue the publication and great praise and thanks are due to the publishers for the assiduity with which they have continued their project. The parts have appeared without intermission for 26 years, the first part having appeared in 1906.—Hy.J.T.

We have received a Catalogue of the Type Specimens of Lepidoptera Rhopalocera in the Hill Museum, which has been compiled by Mr. A. G. Gabriel of the British Museum. This Catalogue was undertaken at the request of the late Mr. J. J. Joicey and is a lasting memorial of the amazing amount of material which had been amassed at the Hill Museum. It is important for all systematic workers to be able readily to find out where the type of a species is and where particulars about it can be found. This list furnishes full details as to name and present (1932) classification, the reference for the original description, date of the same and locality of origin. Some 2000 types are dealt with all of which either have been or are destined to be placed in the British Museum Collections. A most useful piece of work well done.

"What is the meaning of a pupa"? If your contributor, Mr. Norman H. Joy, will read the chapter in Imms "Text-book of Entomology" on Post-embryonic Development he will find the clue to practically all that is known upon the subject he raises, a difficult subject admittedly, but one which a number of workers have investigated, as he will find on perusing the extensive literature quoted by Imms.—N. D. Riley (F.Z.S., F.E.S.).

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CONTENTS

Notes on the Psychidae, Rev. C. R. N. Burrows, F.E.S		117
The Geographical Variations of B. euphrosyne, Roger Verity, M.D.		119
Diptera in 1931, H. W. Andrews, F.E.S		122
On the "Illustrations of European Butterflies," S. L. Mosley (19 1894), C. Mosley, M.B.O.U.	879-	124
Notes on Collecting.—Butterflies of Pulborough, A. J. Wightm Worcestershire Lepidoptera, P. Siviter-Smith; E. jurtina, a qu B. J. Lempke; Birds and S. gigas, T. B. Foster; How R. line swims, H. Donisthorpe; E. vestigialis from Dorset, Hy.J.T.; Scarcit	ery, aris	
Insects, Id.; Immigrants, Capt. Dannreuther, R.N	• •	127
CURRENT NOTES		131
REVIEW.—" Bees, Wasps, Ants and Allied Insects," E. Step, Hy.J.T.		131
SUPPLEMENT British Noctuae, H. J. Turner, F.E.S., F.R.H.S.	(241)-(244)

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Notes on the Psychidae.

By Rev. C. R. N. BURROWS, F.E.S.

When my last contribution to this journal upon the subject was published on February 15th, 1925, I found that I had reached an impasse. I had gathered a huge mass of material, some 2000 specimens or more, mostly prepared for the microscope, I realised that I could get very little further, until I was more certain as to the identity of species. Being no longer able to undertake the journey to London, on account of failing strength and sight, it became impossible to compare my specimens with those in the British Museum. My library is quite insufficient to help me, being confined to Staudinger and Rebel's Catalog, 1901; Seitz Macrolepidoptera of the World, Vol. II.; a reproduction of plates and names of Bruand's Monograph; and lastly Tutt's Brit. Lepid., Vol. II., 1900. To this last I have been greatly indebted, and have continuously referred. I find this last book is very rare now, and feel obliged to quote it now and then, in case my readers should not be able to obtain a copy.

At the point at which I was compelled to hold up my work, I had planned to begin again at the commencement of the series, and examine, systematically, the preparations which I had made. This primary

investigation did not however, reach very far.

Passing over the earlier species (those possessing winged females), I dealt first with the SOLENOBIA. I can add nothing to what I have already said, about the uncertainty of some of the named species.

Of the Genus Bankesia I have already recorded all the information I could find. Later, owing to the kindness of the Abbé J. de Joannis, I have been able to clear up a problem set by Tutt, as to the occurrence of some species on the Continent, especially in the neighbourhood of

Paris. Tutt's enquiry (Brit. Lepid. Vol. 2, p. 212) reads:

"On p. 206 ante, in the synonyms of B. vernella, Const., there is a reference to the conspurcatella of Chrétien (Le Nat. 1893, pp. 103-05), and we are informed (in lit.), by Constant, that Chrétien is responsible for the specimens from Fountainebleau, that he notes as being sent out as conspurcatella, and which he fails to distinguish from the vernella, Const. of the Alpes Maritimes. On reference to Le Naturaliste as quoted, we find in reality, no mention of the moths obtained at Fountainebleau, but Chrétien states that he obtained 200 cases from the Isle of Jersey, where they were in great numbers, on the rocks. The account of the egg, larva, pupa, case, and life-history, that he gives of these, agrees well with that of B. staintoni, but he gives no description of the imago. He then adds that conspurcatella is certainly French, since it is not rare on the rocks in the Forest of Fountainebleau. The Jersey locality suggests strongly the possibility of the insect obtained there being the same species as that taken at Southampton. There is no doubt that vernella, Const., conspurcatella, Chrétien, from Fountainebleau, and conspurcatella, Chrétien, from Jersey, require to be very critically compared, before their relationship can be finally determined."

Of course the name conspurcatella was applied by Chrétien (as by so many more), in ignorance of the separation of this insect under the name staintoni, Walsingham (Ent. Rec. Vol. II., p. 257). The Jersey

species is certainly Luffia lapidella, and not Bankesia staintoni of Southampton Water. It may be well to repeat that the unique specimen of conspurcatella, now in the Zeller collection at the British Museum, is distinguished by the great length of the cilia of the antennae. The specimens submitted to me by Abbé de Joannis assured me that both B. staintoni, Walsm. and L. lapidella, Goeze, occur, or have occurred, in the environs of Paris. Two of his specimens however, which came from a different locality agree well with B. vernella, Const., of which I possess one of Constant's labelled specimens. Both specimens of this very delicate insect were in somewhat poor condition, and that which I used for dissection, had suffered much, yet was just sufficiently preserved to enable me to compare it with my type.

The following is a copy of my determinations as to his specimens

kindly sent to me by the Abbé de Joannis with their localities.

Lufia lapidella, Jersey, Vannes, Athis (11 miles from Paris). Bankesia staintoni, Vannes, Janville, Paris. (Chrétien).

Bankesia vernella, (almost certainly), Lannemerzan. Hautes

Pyrenees.

I am always in doubt. For instance Chapman handed over to me two sets of B. alpestrella, one large from Fusio, the other small. He was quite uncertain which is this species, and what the other might be. So am I. One of the smaller specimens was examined by Durrant, and I have his note to the effect that it is indistinguishable from Zeller's conspurcatella. But it lacks the decisive feature of the long cilia on the antennae.

There are three species ascribed to this genus, and uncertain.

B. douglasella, Stainton, unique. 1 specimen in B.M. B. conspurcatella, Z., unique. 1 specimen in B.M.

B. montanella, Walsm. 26 specimens were taken. All in B.M.

There remains defoliella, Const. of which I know nothing. Of Taleporia, I found that, as far as I could perceive, the second so-called species, politella, agrees exactly with the common tubulosa, the presence of wing-speckling in tubulosa and its absence in politella (of which I possess three specimens), are the only differences I can detect.

Coming to the Fumeidea I may add to my former remarks, that I have grave doubts, still, as to the validity of most of the new species named by Chapman and Tutt. So far as the Tibial Spur ratio serves, I am convinced, that though this may afford some generic evidence of interest, it is possible to carry it too far. I have stated previously the reason for this conviction. I can accept its indication of the genus Bruandia from internal evidence, with which the "spur" evidence seems to agree, but my scanty supply of material prevents me from saying whether I have found more than one species.

Masonia has a certain claim to recognition, but there appears to be

no fine line of distinction, to be drawn between it, and Fumea.

The position of these suggested new species, to my mind, stands thus—of 426 mixed specimens of Bruandia, Masonia, and Fumea, mostly received from Chapman, I have measurements of all available tibial spurs, and compared these with Chapman's. The result is far from convincing, thus—

M. edwardsella C's. figure '71. Limits '65-'72. I have 94 speci-

mens within these.

*M. mitfordella C's figure .70. Limits .70.-76. I have 63 specimens within these.

+M. hibernicella C's. figure ·67. Limits ·76 · ·77. I have 29 specimens within these.

F. bowerella C's figure ·77-·80. Limits ·77-·80. I have 145 specimens within these.

 $F.\ scotica$ C's figure ·78-·81. Limits ·78-·81. I have 171 specimens within these.

‡F. germanica C's. figure ·86-·88. Limits ·81-·88. I have 166 specimens within these.

*I have Chapman's type specimen, and two mounts of legs. 23 of my measured specimens are actually ascribed to Mitford as captor.

†There is evidently some error here, for Chapman places the Ratio at ·67 (" Entom. Rec., 1900, p. 123") while the measurement of his own specimens is ·76-·77, which comes well within the usual position of Fumea casta.

‡I have his own specimen without body, labelled in his own writing var. germanica, and his mount of a leg. I have no British Masonia, and imagine that the only evidence of the genus in this country is the pairing of a foreign male, with a British female recorded by Chapman. Probably this female was Fumea casta. I record a similar occurrence, between a male of L. lapidella from the Channel Islands and a female L. ferchaultella from Mucking. All these Tibial Spur measurements fall between '65-'88, Tutt gives '65-'71 to Masonia, and from '72-'88 to Fumea. It is evident that the figures for these new species overlap, and are entirely indefinite.

I have no \check{F} umea with ratio '88. The most frequent measurement for the genus is .80 which covers the three new species. For Masonia

it is .70-.71 which embraces edwardsella and mitfordella.

(To be continued.)

The Geographical Variations of Boloria euphrosyne, L.

By ROGER VERITY, M.D.

To end with a few words about the eastern races of euphrosyne, it must first be noted, in a general way, that this species has no representative in America, whereas most of its congeners exist there (aphirape, selenis, chariclea, pales, freija, polaris, frigga). The fact that the other broadspread western species, selene, does not exist there either and that the very interesting hegemone, Stdgr., restricted to the mountains of Central Asia, exhibits a mixture of the features of both those species and also seems to connect them with aphirape, which it resembles to an extraordinary degree, gives one the impression that the development and the history of this genus would be well worth working out, as I have attempted to do it in the case of the Melitaea.

Here, however, I must limit myself to remarking that the Central exerge of euphrosyne only exists to the west of Central Asia, as though it had developed when this species joined the great western migration, during the Miocene, whilst the stock which remained further north, in Siberia, became the Northern exerge and culminated into fingal where it

underwent more glacial conditions and particularly during the Glacial Epoch. In other words, the development of euphrosyne, of selene and of hegemone seems to have been a later (from the end of the Cretaceous to that of the Oligocene) repetition, on a smaller scale, in Asia, of the process which had in previous geological Epochs originated, in the great Polar Continent, aphirape, selenis and the more extreme glacial species, mentioned above, which have subsequently spread southward in America as well as in the Palaearctic region. There unquestionably must have been general causes which have affected many generic groups in this same way and made them develop according to certain rules. The very similar distribution of Melitaea saxatilis and of the recently separated species ala to that of B. hegemone, not to speak of their resemblance to it in some features, compared with the broadspread didyma and trivia in the first case and to euphrosyne and selene in the second, cannot be a mere coincidence, if one bears in mind there are several other cases of the same kind, such as that of Parnassius discobolus compared with apollo. I have pointed out in other papers how the origin and the migrations of this western species can only be accounted for, in a way exactly contemporary and parallel to that described above in euphrosyne, by the late repetition in Asia of the process which had produced nomion and phoebus (=delius) from bremeri- and eversmannilike ancestors in the Polar Continent.

Thus, P. apollo and B. euphrosyne must have reached the Mediterranean region, following the Elburz chain of mountains, during the Miocene cold period, when they were driven down by the climate from the mountains of Central Asia. From this stock has presumably descended the Central exerge of euphrosyne, as I have already mentioned, and a long time after, when the Glacial Epochs had come and gone, it evidently spread northward, into southern Russia, at the same time as it did in Central Europe. At Saratoff there exists, in fact, with many Mediterranean species, a race of euphrosyne, which is highly characteristic of the central exerge and recalls the nestonclara of Berlin; it has been named rusalka by Frühstorfer; race dagestanica, Sowinsky, described from the Dagestan Territory, is, apparantly, more like cynosoma of Geneva; race phaënna, Jachontov, of Borzhom in Transcaucasia, seems to belong to the same group, but I find no absolute evidence of it in the original Latin diagnosis: "Supra paullo fulvior, subtus lituris ad apicem alarum anticarum saturatius flavis, alis posticis maculis argenteis splendidissimis, antemarginalibus autem majoribus, area postmediana latius ferrugineo-nebulosa, fascia media saturatius flava." There can be no question, on the contrary, concerning the race of Amasia, which Rühl describes, p. 423, as "larger and more lightly coloured on both surfaces," and which, in fact, might well be called magnaclara. to note how also the small mountain race of the Caucasus, anka, Frühst., has small black markings on both surfaces and is delicately coloured, so that it certainly is a mountain race of the Central exerge and this species falls in with the general rule that none of the alpine species or exerges of Siberia have reached the Caucasus.

Vice-versa, as I have already stated, in Siberia and in China there is nowhere any trace of the central exerge, such as one finds it in many other species originating in those regions. The three races which have been described belong markedly to the Northern exerge and all exhibit very constantly the noteworthy peculiarity, as compared with those of

the west, of a greater accentuation of the marginal and premarginal row of black markings in proportion to those of the basal half of the wing; they thus stand still further from the central exerge: Race orphanus, Frhst. of the Siberian Amur (no exact locality) is said to be as pale in colour on both surfaces as answing of Norway, but with large black markings, as in fingal; the underside is more uniform in colour than the European examples and the marginal spots of the hindwing are larger. This description applies perfectly to the specimens of both sexes from Chulugaischa, 2600 m., near Mondy, in the eastern Sajan mountains and from Tunkun in the same region. Two years later than Frühstorfer's description Seitz described and figured from the Sajan under the name of umbra a peculiar "form" (he does not state in the least it is racial) which "bears, on the hindwing beneath, between the distal margin and the median band, dark brown clouds, which render the outerhalf of the hindwing similar to that of selene"; the figure completes the description by exhibiting an abnormal dark chocolate brown tone, instead of the usual russet one. It would thus be quite a mistake to apply the name of umbra, which is an aberration more than an extreme individual form, to the race of the Sajan, as Bang-Haas did when he sent me the specimens. Let us not start one of these fatal mistakes, which get carried on for ever, and let us call the race of that locality by the racial name of orphanus, unless it is discovered that it is different from Frühstorfer's and a new one is required, but, anyhow, it must not be umbra.

Another large series sent to me by Bang-Haas too, and which is from the same region, but evidently caught in a different year and in a different place, because the printed label is worded differently and the altitude is stated to be 3100m., has quite another aspect. In this set of specimens, still less than in the preceding, does there exist in any of them the dark underside shade, which has suggested the name of umbra to Seitz. Apart from their much larger size, about equivalent to the average one of neston, the European race they resemble most by markings and colours is the dwarf rarianana from Durham. The former, in fact, are much less extensive than in orphanus and the latter are of a much brighter and richer tone on both surfaces; the russet red is an approach to that of fingal and in some specimens it is also nearly as uniformly spread on the hindwing, whilst in others it is broken up into patches by clear yellow spaces and it recalls the chequered appearance of rarianana. I think this race should be named

orientisvivax.

Finally there is the very distinct race kamtschadalis of Staudinger's price-list, which Seitz describes quite inadequately, but figures recognisably. As some of Staudinger's cotypes labelled: "Kamchatka," are in my possession, I can add that the colours are very dull and pale on both surfaces and the black markings remarkably thin for an eastern race and rather like those of apenuina, except, of course, that the marginal and the two premarginal rows of spots are not more reduced than the rest, as they are in the Central exerge, and the marginal silver ones of the underside are particularly large; the russet of this surface is brownish, but thin and dull, so that it does not stand out.

Diptera in 1931.

By H. W. ANDREWS, F.E.S.

A long succession of wet week-ends in the spring and early summer and a general absence of sun made 1931 a disappointing year as regards weather, and told against one, who like myself, is not free to devote all his time to his hobby and thus unable to take full advantage of fine weather when it occurs; but the following extracts from my diary may

be of sufficient interest to justify their existence in print.

A late spring and poor weather made sallow-collecting a blank as far as I was concerned, but on April 11th, I got a series of the Helomyzid Neoleria ruficauda, Ztt. \mathcal{J} \mathcal{J} , off the contents of a game-keeper's larder in the Bexley Woods. I have taken this species in similar situations in other localities of N. Kent. On May 9th in Farningham Woods I got two or three Ernestia neilseni, Vill., and one \mathfrak{L} Platypeza infumata, Hall: this latter is the second specimen only that I have taken in N. Kent, the first being at Dartford in October many years ago. On the 22nd I visited the Hylephila locality at Hextable. H. personata, Coll. was common, \mathfrak{L} \mathfrak{L} only and I got 3 H. obtusa, Ztt. \mathfrak{L} \mathfrak{L} . In both these species I have found the \mathfrak{L} \mathfrak{L} very much more abundant than the \mathfrak{L} \mathfrak{L} , while in H. sponsa, Mg., the reverse is the case, the \mathfrak{L} being extremely scarce*.

On my way home I passed a small stack of bags of fertiliser by the side of a field-path and found it swarming with *Protocalliphora terranovae*, R.D. I had taken this species formerly, by a fish-manure factory in the Thames Marshes, but had not met with it elsewhere. I have

little doubt it had bred out of the fertiliser.

No other item worth recording till May 30th, when at the Eastbourne Meeting of the Entomological Club I was able—thanks to Mr. Collin who put me on its track—to get a small series of the Anthomyiid Chortophila (Nudaria) flavidipennis, Stein., a recent addition to our lists, by sweeping Silene maritima on the shingle beds at The Crumbles; Helomyza modesta, Mg., was very common there and single specimens of Sarcophaya haemorrhoidalis, Mg., and Sarcophila latifrons, Fall., were taken.

From June 27th to July 2nd, I was on holiday at Tunbridge Wells, a fine week but for some reason or other disappointing as regards collecting; the rhododendrons were over and the thistles and large umbellifers not fully out. The only dipteron worth recording was Dioctria linearis, Mg.: in some 25 years collecting I had only taken three odd specimens of this species, but in the last few days of my stay I discovered a small colony in the woods near Eridge Warren and got a good series of both sexes, also a record of one with prey (a small Empid), which was of interest as there did not appear to be any previous British record on the prey of this species. In the same locality I took Beris morissii, Dale. On July 12th I got a nice dark form of Ischyrosyrphus laternarius, Müller, at Farningham, and on July 25th I got a 3 Phaonia ruipalpis, Mcq., an addition to my local list of N. Kent Anthomyiids. On August 1st at the Thames Marshes by Abbey Wood

^{*}This year (1932) going earlier, on May 7th, I got several 3 3 F. personata and 9 9 were scarce, pointing to a difference in time of emergence of the two sexes.

I got a Fannia glaucescens, Ztt., which I have taken sparingly in the

same locality, but never found in abundance.

From August 29th to September 13th I was at Salisbury on a "family" holiday with a week-end at Linwood in the New Forest on September 6-7th. The weather though not all that could be desired was tolerable. This locality was new to me and looked very promising but I did not have sufficient time to myself to do much collecting. On September 1st I had a day's collecting with Mr. E. Rivenhall Goffe who first motored me to the Forest to the locality where Messrs. Collin and Wainwright turned up Hydrotaea borussica, Stein, in 1930. Goffe had previously sent me a number of females of H. borussica, which come round about one like H. iritans which species they closely resemble. This insect was still about and we managed to get a few of the high hovering 3. Then in the afternoon Mr. Goffe took me to his collecting ground at Farley Down, where the same two dipterists took in one day in August over 50 species of Tachinids, and where other rarities such as Tabanus glaucopsis, Mg., and Machimus rusticus, Mg., have occurred. I was there considerably later in the year on a dull day that wound up with a steady drizzle of rain, but I saw enough to realise what a delectable spot it was and despite the poor weather took several species more or less common, and half a dozen Dexia rustica, Fab., a species new to me.

As stated above I spent September 6th and 7th at Linwood, on the western edge of the New Forest and had the pleasure of getting some collecting under the guidance of Dr. F. H. Haines, and looking at some of his large collections of insects of all Orders, coming away with some rich booty in the shape of several types of rare and local Diptera he generously gave me. On Sunday there was the unusual sight of four dipterists collecting together, as Dr. Haines had telephoned to Mr. Goffe to come over and he had brought Mr. Audcent who was staying with him after a holiday in the south of France, where in contrast to us they had been suffering from a heat wave. After a preliminary ramble through the neighbouring enclosures we motored to Matley in the hope of getting some Eristalis cryptarum, Fab., but a long search only produced one specimen. I swept a small series of Trichopticus (now Lophosceles) cristatus, Ztt., off Umbelliferae, and took a single Hammomyia grisea, Fall., on the way to the sandpit. On the Monday Dr. Haines took me to Highland Water enclosure in search of Arctophila mussitans, Fab., but here again only one specimen was taken.

Finally on September 19th, in the Bexley Woods I got a series of Didea intermedia, Lw., along the side of a fir-plantation, and to my delight and surprise a very fine \circ of Didea alneti, Fall., a prolonged search produced no more, nor did another visit the next day, but in compensation I took another prize in the shape of a 3 Echinomyia ferox, Pz., and with these two new records for the district my active

collecting for 1931 came to an end.

Third plate:

On the "Illustrations of European Butterflies" by S. L. Mosley (1879-1894).

By CHARLES MOSLEY, M.B.O.U.

(Curator of The City of Wakefield Museum and Art Gallery.)

(Continued from page 110.)

Part XXVIII., 1882. Containing 4 Plates (9 Figures). Representing 5 Species.

First plate: 17. Pieris napi, Linn. Three figures (two upper sides—male and female—and an under

side).

Second plate: 125. Satyrus hermione, Linn. Two figures (upper and under sides).

229. Polyommatus gardius, Esp. Two figures

(upper and under sides). Fourth plate: 291. Pyryus malrarum, Linn. One figure.

293. Pyrgus lavaterae, Esp. One figure.

Part 29, 1882. Containing 4 Plates (11 Figures). Representing 5 Species.

First plate: 97. Pyrameis cardui, Linn. Three figures (upper and under sides, and larva) on

sprig of Thistle.
Second plate:
61. Melitaea asteria, Fr. Two figures (upper

and under sides).
Third plate: 73. Argynnis thore, Hub. Two figures (upper

and under sides).

Fourth plate: 238. Lycaena fischeri Esp. Two figures (upper and under sides).

239. Lycaena trochilus, (no authority). Two figures (upper and under sides).

Of the four figures on this plate, there is no indication as to which belong to which species.

Part 30, January, 1884. Containing 4 Plates (15 Figures). Representing 4 Species.

First plate: 81. Aryynnis aglaia, Linn. Three figures (male and under side, and female) with plant of Hearts-ease.

Second plate: 101. Limenitis sibylla, Linn. Four figures (upper and under sides, larva, and pupa) on spray of Honeysuckle.

Third plate: 104. Apatura iris, Linn. Five figures (male and under side, female, larva, and pupa) on sprig of Willow.

Fourth plate: 210. Nemeobius lucina, Linn. Three figures (upper and under sides, and larva) on plant of Cowslip.

Part 31, January, 1884. Containing 4 Plates (16 Figures). Representing 4 Species.

First plate: 211. Thecla betulae, Linn. Four figures (male, female and under side, and larva) on sprig of Blackthorn in fruit.

Second plate: 213. Theela w-album, Kh. Five figures (upper and under sides, two forms of the larva, and pupa) on sprig of Wych Elm in fruit.

Third plate: 216. Thecla pruni, Linn. Three figures (male and under side, and female) with sprig of Blackthorn in flower.

Fourth plate: 218. Thecla quercus, Linn. Four figures (male, female and under side, and larva) on sprig of Oak.

Part 33,......1884. Containing 4 Plates (8 Figures). Representing 4 Species.

First plate: 68. Argynnis polaris, Bdv. Two figures (upper and under sides).

Second plate: 110. Melanarge larissa, Hub. Two figures (upper and under sides).

Third plate: 114. Melanarye pherusa, Bdv. Two figures (upper and under sides).

Fourth plate: 115. Melanarye arge, Sulz. Two figures (upper and under sides).

Part ? 1884. Containing 4 Plates (9 Figures). Representing 4 Species.

First plate: 176. Erebia epiphron, Kh. Three figures (upper and under sides, and variety cassiope, Fab.).

Second plate: 179. Erebia arete, Fab. Two figures (upper and under sides).

Third plate: 184. Erebia oeme, Esp. Two figures (upper and under sides).

Fourth plate: 208. Erebia disa, Th. (Two figures (upper and under sides).

Part ? (an old cover used and not correctly numbered nor dated).

Containing 4 Plates (10 Figures). Representing 4 Species.

First plate: 50. Melitaea desfontainesii, Bdv., a variety of artemis? Two figures (upper and under sides).

Second plate: 79. Argynnis elisa, Gdt., 1823; cyrene, Bon., 1826. Two figures (upper and under sides), with spray of Bluebell.

Third plate: 103. Nymphalis populi, Linn. Two figures (upper and under sides).

Fourth plate: 152. Triphysa phryne, Pall. Four figures (male and under side, female and under side).

Part ? (same remarks as against the last part). Containing 4 Plates (15 Figures). Representing 5 Species.

First plate: 235. Lycaena telicanus, Hub. Three figures (male and female, and an under side).

236. Lycaena balcanica, Fr. Three figures (male, and female, and an under side).

Second plate: 237. Lycaena tiresias, Rg. Three figures (male and under side, and female).

Third plate: 241. Lycaena argus, Linn. Three figures (male

and under side, and female). Fourth plate: 269. Lycaena daphnis, W.V. Three figures (male

and under side, and female).

Part 43,......1886. Containing 4 Plate (17 Figures). Representing 4 Species.

First plate: 233. Polyommatus halle, W.V. Two figures (upper and under sides).

Second plate: 240. Lycaena aegon, W.V. Five figures (male, female and under side, larva and pupa).

Third plate: 261. Lycaena alexis, W.V. Five figures (male, female and underside, larva, and pupa) on sprig of Restharrow.

Fourth plate: (Missing).

Part 59. No intervening parts are available between 43 and 59.

Some time in the interim a new cover has been adopted with the following printing, "Water-colour Drawings of European Butterflies, taken direct from Nature by S. L. Mosley, F.E.S., Hon. Memb. Lancs. Ches. Ent. Soc., etc. Founded on Kirby's Manual. Huddersfield: Museum of Economic Natural History, 1894."

First plate: 250. Lycaena lysimon, Hb. Three figures (male and under side, and female).

Second Plate: 251. Lycaena rhymnus, Esp. Two figures (upper

and under sides).
Third plate: 252. Lycaena psylorita, Fr. Two figures (upper

and under sides).

Fourth plate: 289. Lycaena arion, L. Two figures (upper and under sides).

This part also contains Title-pages and Table of Contents for volumes 1, 2, and 3, into which it was intended the work should be divided; there is also a Preface, dated Huddersfield, February 6th, 1884," from which the following paragraphs are extracted:—

"This Series of Figures was begun in 1884, but pressure of other important work, and latterly the difficulty of obtaining authentic and reliable specimens, have retarded its completion. The figures have all been painted by my own hands, and I found it impossible to secure any assistant who could produce similar work at the same rate. So the number of copies issued has been, necessarily, limited. I started with 13 Subscribers. One half of these have

dropped off, from deaths, or other causes, so there will not be more than half a dozen complete copies of this work in existence.

"I hope that this collection of Figures will be found to be of almost as much service to the student of Rhopalocera, as a collection of the real insects."

(To be concluded.)

TO OTES ON COLLECTING.

BUTTERFLIES OF THE PULBOROUGH DISTRICT (WEST SUSSEX).—During the last five years, I have kept a record of the various species of butterflies, which I have noted to occur in the above district, which I define as five miles in any direction from the Southern Railway station. This area contains a great deal of meadow-land and marsh, but is well wooded especially to the north and west, while there are also considerable areas of downland and heaths. The remarks as to the abundance or otherwise simply give my impression, as I have never worked for any butterflies and it may well be that some species I have thought local are in fact wide spread.

Pieris brassicae, P. rapae, and P. napi: abundant.

Euchloë cardamines: plentiful.

Leptosia sinapis: very local and not plentiful.

Colias hyale: once only.

C. croceus (edusa): most seasons in small numbers and some years abundant.

Gonepteryx rhamni: plentiful.

Apatura iris: rather local and apparently scarce.

Limenitis sibilla: plentiful.

Polygonia c-album: rather plentiful these last few years.

Aglais urticae and Vanessa io: abundant.

Pyrameis cardui and P. atalanta: usually plentiful.

Dryas (Argynnis) paphia: plentiful in woods. Argynnis adippe and A. aglaia: fairly plentiful. Brenthis euphrosyne and B. selene: plentiful.

Melanargia galathea: local. Satyrus semele: rather local.

Pararge aegeria: abundant in woods.

P. megera; plentiful.

Epinephele jurtina and E. tithonus: plentiful.

Aphantopus hyperantus: plentiful. Caenonympha pamphilus: plentiful.

Zephyrus betulae: well distributed but nowhere abundant.

Strymon quercûs: abundant. Thecla w-album: local. Callophrys rubi: plentiful. Rumicia phlacas: plentiful. Cupido minima: local.

Plebeius aegon: abundant on heaths.

Aricia medon (astrarche): abundant on downs. •

Polyommatus icarus: abundant. P. coridon: abundant locally. P. thetis (bellargus): local. Lycaenopsis argiolus: plentiful.

Hamearis lucina: local. Hesperia malvae: plentiful.

Nisoniades tages and Adopaea flava (thaumas): common.

Augiades comma: scarce. A. sylvanus: plentiful.

A. J. WIGHTMAN.

EUPITHECIA PUSILLATA IN WORCESTERSHIRE.—I have recorded the date of the capture of the specimen mentioned on page 70 of the May issue of this magazine as May 25th, 1931. This is a mistake on my part, as it should be May 25th, 1930.

Hylophila bicolorana, Fuess. (quercana, Schiff.) can be added to the list of species occurring in the Ran-dan Woods, Wors., as I now know that a larva I found in June, 1930, in the woods was that species. I failed to rear it.

Gastropacha Quercifolia, L., in Worcestershire.— On July 16th last I had the pleasure of rearing a splendid female of this species, from a larva beaten from wild plum near this village on June 5th, I fancy it is not a common insect in this district.

Immigrant Lepidoptera.—Plusia yamma first appeared on the Cotswolds on June 12th, when I saw about five at Guiting, and netted two worn males, and a female in better condition. It has been common everywhere since that date. The only Pyrameis cardui I have seen were two in Kent, both very worn indeed, one at Herne Bay on July 3rd, and one near Margate on July 8th. A male Macroglossum stellatarum caught at Valerian in the garden here on June 28th looks almost in too fine condition to be a migrant—the fringes are hardly worn at all.

Rhopalocera are very scarce this year. I have only seen two Rumicia (Chrysophanus) phlaeas, one in Cornwall in May and one in Kent in July, and only one Aglais (Vanessa) urticae, also in Kent at the beginning of July.—P. Siviter Smith, Pebworth.

A QUERY RE EPINEPHELE JURTINA—Epinephele jurtina, L. ab. splendida, B. White is described in Scott. Nat. I. 200 (1872) as follows—"Larger and brighter coloured; the apical spot of the front wing with two white dots." He adds that it is the only form to be found in the island of Longa, on the west coast of Rossshire, that it is occasionally found in Aberdeenshire and that he has also taken it in the island of Capri. Could any of our readers give us more information about this form, e.g., Is it really the only form of Longa Island? and is it a combination of the forms fulvocincta, Fuchs and bioculata, Rebel, as I suppose from the description? A more detailed description is badly needed.—B. J. Lempke, Amsterdam.

Birds and Sirex gigas.—The following observations may be of interest. Beneath the sloping glass roof of my verandah a variety of insects are trapped daily (and nightly) owing to the fact that the angle formed by the wooden plate and the end of the glass affords no exit. Many species of moths, flies, bees, wasps, beetles, etc., incessantly keep to the line of the glass and few only escape the birds (mostly sparrows) that fly in to "clear them up" especially in the early hours after daybreak. About a fortnight ago a fine specimen of Sirex gigas arrived and roused me with the noise of the rapid vibration of its wings against the glass (I sleep on the verandah), but although the birds have been busy with their usual slaughter of trapped insects, this formidable looking though harmless creature had not been attacked.

LIMENITIS SIBILLA IN CROYDON.—My wife saw a freshly emerged Limenitis sibilla flying in the strong sunshine over some fruit vegetable stalls in Surrey St. (Croydon) one day last week. This thoroughfare is a street market, and two or three excited people tried to catch the butterfly. I am glad to say they did not succeed and that it flew safely

away.

Î have never met either of the above mentioned insects before in these densely built-up parts of Croydon, that is, not in a state of nature.—Thos. B. Foster, Croydon, July 26th.

How Ranatra Linearis, L., swims.—This large water-bug occurs in a large and ancient pond in Windsor Forest; though widely distributed it is a decidedly local species in England. On May 1st last, when fishing for water beetles in the above mentioned forest, several specimens were taken, and subsequently housed in an aquarium in the Natural History Museum—one at least being still alive.

The object of this note, however, is to describe how we saw the bugs swimming on the top of the water. Butler describes this in his Biology of the British Hemiptera as follows:—" The swimming is done mainly by the hind legs, which are then moved simultaneously and with a graceful motion like that of a frog's hind legs. The intermediate legs are also moved simultaneously, but in a less rhythmical way. . . . The raptorial legs are sometimes moved vertically in the water as if to aid in progression." But what we saw was quite different to this. The bug appeared to stand on the water in a slanting position and using the front legs like a dog swimming, and swimming with the back legs, it rushed forward, looking like a miniature motorboat. We observed this several times; one specimen swept out and round in a great circle; another went right across the large pond in an incredibly short time, leaving a regular wave, as if from a steamboat, in its wake. The day was warm and sunny which probably stimulated the creatures, and it looked as if they were taking this exercise purely for pleasure. In the aquarium they are very sluggish, and remain submerged beneath the surface of the water.—Horace DONISTHORPE.

Euxoa vestigialis from Dorset.—More than 2 years ago my kind correspondent, Mr. Parkinson Curtis of Parkstone, Dorset, very thoughtfully sent me the following note for inclusion in my British Noctuae notes. This was pigeon-holed and forgotten. Still I think rather than be so long deferred it would be better to record the form described in print.

Mr. Curtis writes thus, "There is one beautiful form, which seems to be worth naming and apparently has not so far been named. It is not very common here and occurs in both sexes. The double basal line is the usual two rich madder brown lines with a grevish interspace, but the basal between vein 1 and the median nervure is a very lively pale burnt sienna brown. The colour unfortunately deteriorates after death somewhat, but I have a 3 before me, which is particularly well marked, and besides has the patagia tipped with the same ruddy brown, which is a very unusual feature in my experience. The form may of course be usual elsewhere, but I am told the vestigialis from Dorset are particularly well-marked." In a consideable series we note one or two which approach the above, but none are marked sufficiently to be conspicuous, and some, especially the females, certainly have this feature almost distinctively dark as in Newman's fifth figure. Newman, in his description mentions this oval area as being light brown. suggest the name basidistincta for this form with the almost pink basal oval.—Hy.J.T.

Rhodometra (Sterrha) sacraria in Sussex.—On the West Sussex Downs to-day I took a 3 R. (S). sacraria in bred condition. At the same spot 3 Colias croceus were seen.—H. B. Williams (LL.D., F.E.S.) August 23rd.

[Another example has been taken by Mr. Rayward at Eastbourne.—Hy.J.T.]

Scarcity of Insects.—A day spent on the "Crumbles" at Eastbourne (August 17th) on one of the extremely hot days produced the now usual paucity of Lepidoptera. Heliothis peltigera, eight mediumsized green larvae on the Senecio viscosa. Six pupae of Dianthoecia carpophaga. Abundance of Plusia gamma. One Pyrameis cardui. One Pararge megera. One or two Pieris brassicae. A solitary micro unidentified. A few Epirrhoë galiata, the dark banded form. It was suggested that we might get all sorts of things but not even a solitary C. croceus was seen and even the flies (Diptera) ceased to worry.—Hy.J.T.

Immigrants.—So far no Pyrameis cardui has been seen in Hastings this year until August 13th, when one was taken and released next day; it went up to at least 300 ft. when set free and flew due north. After one P. atalanta on May 28th no further specimen was seen until August 8th when seven were seen. As far as I know Niton in the Isle of Wight was the only place recorded P. cardui in numbers in May. Two Macroglossum stellatarum were caught at Round Island Red Light in the Scillies in June. In July the Light Vessel (7 miles S.S.E. of Selsey Bill) sent me many moths in the light westerly winds. include Ourapteryx sambucaria, Abraxas grossulariata, Tortrix viridana, Cabera pusaria, Pieris brassicae, and others which Mr. Wm. Fassnidge has for identification. Perhaps some of these may be classed as "reinforced resident." Seven miles off seems hardly far enough for certainty though that is as far as Aglais urticae has ever been reported. The Owers also sent in two "lacewings" in their catch. Plusia gamma has been repeatedly seen at Hastings since June 28th. P. atalanta released on August 15th flew north as did 3 Colias croceus on August 9th.—From Notes received from Captain Danneuther, August 15th, Hastings.

REVIEWS 131

CURRENT NOTES AND SHORT NOTICES.

A meeting of the Entomological Club was held at Eastbourne on May 28th, 1932, Mr. Robert Adkin in the Chair.

Members Present in addition to the Chairman:—Mr. H. Donisthorpe, Prof. E. B. Poulton, Mr. H. Willoughby-Ellis, Mr. Jas. E. Collin, Dr.

Harry Eltringham, and Mr. W. J. Kaye.

Visitors Present:—Mr. B. W. Adkin, Mr. H. W. Andrews, Dr. R. R. Armstrong, Maj. E. E. Austen, Mr. G. T. Bethune-Baker, Mr. E. C. Bedwell, Mr. K. G. Blair, Dr. Malcolm Burr, Capt. J. D. Dannreuter, Mr. H. M. Edelsten, Mr. F. W. Frohawk, Col. F. A. Labouchere, Dr. H. Lankester, Mr. Hugh Main, Rev. John W. Metcalfe, Mr. W. Rait-Smith, Mr. Edwin P. Sharp, Mr. J. R. le B. Tomlin, Mr. Alfred E. Tonge, Mr. H. J. Turner, Mr. G. C. Leman, Rev. Geo. Wheeler, and

Mr. Cyril G. M. de Worms.

Several of the guests arrived by car. Those travelling by train were met at the station by the Chairman and conveyed to the Grand Hotel where luncheon was provided in a private room at 1.15 p.m. After luncheon the party divided, one section making a tour of the Downs and the other of the Crumbles. The latter locality provided Mr. Collin with a series of Delia flavidipennis, Stein., on Silene. The Entomological Club Supper took place at the Grand Hotel at 6 o'clock, and after a most enjoyable evening many of the guests returned to London. The Chairman had kindly extended an invitation to all who were able to stay over the week-end and this was very freely accepted, a considerable number remaining. Owing to Mrs. Adkin's delicate health all were accommodated at the Grand Hotel. On Sunday morning an excursion in motor cars was organized to Abbotts Wood. The rides and wood generally after the recent rains were in a very sodden and muddy condition. The weather at first was rather dull and insects appeared to be scarce, but during the morning the sun shone brilliantly and insects were very plentiful, and Pyrochroa coccinea was flying freely in the sunshine. On returning to Eastbourne luncheon was provided at the Grand Hotel Public Dining Room. During the afternoon a visit was paid to Hodeslea, Meads, the Chairman's residence, where tea was provided and the gardens inspected. In the evening the Chairman and his family entertained the guests to dinner at the Grand Hotel, after which an exellent concert by the Hotel Band was much enjoyed. The meeting was throughout most successful and enjoyable, and the party broke up on Monday morning .- H. WILLOUGHBY-ELLIS.

REVIEWS AND NOTICES OF BOOKS.

Bees, Wasps, Ants and Allied Insects of the British Isles, by Edward Step, F.L.S., 264 pp., 44 coloured plates, 67 other plates, 64 wing maps, and many text figures. Price 10/6, Messrs. Frederick Warne and Co., Ltd.—Earlier in the year we recorded the death of a great figure in the dissemination of a knowledge of the natural history of our own country, the late Edward Step, F.L.S. We now have had sent to our table a posthumously published work, the last unfortunately, of which he had completed the MS. just previous to his death. We

have no hesitation in saying that it is the best of all his works. It is a happy combination of author and publisher, in which both have done their best to produce a book, which must be of inestimable value to field naturalists. The amount of classified information pleasantly put by the author and the unstinted wealth of illustrations by the publishers make it one of the cheapest books of its kind on the market. The price versus the contents is negligible. An Introductory Book on the Order Hymenoptera has been a great desideratum for all time. We have had erudite volumes on sections of the Order, of little use to the incipient student, or to the field naturalist, but no book existed where the average nature lover of a countryside could run down, more or less closely, the bees, wasps, ants, etc., one so often disturbs in the open field or garden of flowers. The wing venation is a structure of much use in the discrimination of the various sections of the Hymenoptera, and here we have no less than 64 diagrams of such. Lepidopterists often meet with larvae of Sawflies when beating; here we have two coloured plates of 24 figures of the more commonly occurring kinds. Illustrations of the saws of this group are given as text figures, and 5 plates are devoted to figure many species of sawfly. Of the Ichneumons there are 5 plates figuring numerous species and of the gall-flies numerous illustrations both of species and of galls.

The body of the work deals with the Hymenoptera-Aculeata, the Humble-bees, Cuckoo-bees, Social Wasps, Potter Wasps, Mason Wasps, Spider-hunting Wasps, Sand Wasps, Digger Wasps, Wood-boring Wasps, Solitary Bees, Mining Bees, Carpenter-bees, Homeless Bees, Ants, etc. Under each of these classes we have a readable general account of the creatures, with perhaps a reference to those who have made a special study of them, and then particulars and illustrations of the more commonly met with species. These illustrations are not limited merely to the figure of the species, but include cells of the Mason-wasp, ditto opened up, heath potter-wasp building its clay cell, queen wasp scraping a wooden post for material for "paper-making," leaf-cutter bee entering its nesting site, sand-wasp dragging its victim a paralysed caterpillar, and so on. The ordinarily met with bees, humble-bees, wasps, ants, etc., are similarly dealt with; one interesting chapter describes the lives of the "cuckoo-bees," of the fights between unwelcome visitor and unwilling host, and another chapter the violent banditry of the murderous spider-hunting wasps. The fascinating life-histories, so wonderful in their variety and interest, although known to the specialist perhaps for many years, are in this work brought together, compared and contrasted for the first time for the general lover of nature. Our local societies must have a copy of this work on its shelves and individual members will find a personal copy is indispensable. Appended we have a short list of reference books, a classified list of families and genera referred to in the book, a glossary of terms and a capital index, in fact nothing is omitted to spoil the completion. We congratulate the publishers, Messrs. Frederick Warne and Co., on the result of their efforts and trust that their reward may be a circulation better than they even anticipate.—Hy.J.T.

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Subscribers may have Lists of Duplicates and Desiderata inserted free of charge. They should be sent to Mr. Hy. J. Turner, "Laternar," West Drive, Cheam.

Duplicates .- S. Andrenaeformis, Bred 1928, well set on black pins, with data.

Desiderata.—Very numerous British Macro Lepidoptera.—J. W. Woolhouse, Hill House, Frances Street, Chesham, Bucks.

Desiderata.—Species of Dolerine and Nematine sawflies not in my collection; list sent.—R. C. L. Perkins, 4. Thurlestone Road, Newton Abbot.

Duplicates .- Albimacula*, sparganii*.

Desiderata.—Ova of D.oo. pupae of X. gilvago, D. caesia. A. J. Wightman, "Aurago," Bromfields, Pulborough, Sussex.

EXCHANGES.—Living Eggs of Catocala fraxini and sponsa, exchange for butterflies of British Isles.—C. Zacher' Erfurt, Weimar, Street 13, Germany.

Duplicates.—Pyralina*, Salicis, Ianthina*, Orbicularia*, Repandata in variety, Doubledayaria, Black rhomboidaria*, Black virgularia* and others.

Desiderata.—Hyale, Welsh aurinia, Polychloros, Tiphon Agathina, Lunigera, Lucernea, Neglecta, Diffinis, Populeti, Gothica v. gothicina, White Leporina, Tridens Putrescens. Littoralis, Typhae v. fraterna, Rurea v. Combusta, Gilvago, Fulvago v. flavescens, Liturata v. nigrofulvata. Harold B. Williams, Woodcote, 36, Manorgate Road, Kingston Surrey.

Duplicates.—A large number of species of European and Palaearctic Rhopalocera and Heterocera.

Desiderata.—All British species especially those illustrating characteristics of an island fauna. Dr. Lor. Kolb, München 54, Dachauer-str. 409, Germany, and Franz Daniel, München, Bayer-str. 77, Germany.

MEETINGS OF SOCIETIES.

Entomological Society of London.-41, Queen's Gate, South Kensington, S.W. 7.

8 p.m. October 5th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. September 22nd. October 13th, 27th.—Hon. Secretary, S. N. A. Jacobs, "Ditchling," Hayes Lane, Bromley, Kent.

The London Natural History Society.—Meetings first four Tuesdays in the month at 6.30 p.m. at the London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, W.C.1. Visitors admitted by ticket which may be obtained through Members, or from the Hon. Sec. A. B. Hornblower, 91, Queen's Road, Buckhurst Hill, Essex.

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CONTENTS

Notes on the Psychidae. XIII. (With plate.) Rev. C. R. N. Burro F.E.S		133
On the "Illustrations of European Butterflies," S. L. Mosley (18 1894), C. Mosley, M.B.O.U. (concluded)		135
Newly described forms of Species found in Britain, $Hy.J.T.$:	138
Zygaenae, Grypocera and Rhopalocera of the Cottian Alps, Dr. Roverity		139
Notes on Collecting.—E. jurtina subsp. splendida, P. P. Graves, F.E.	.S.	142
Current Notes		143
Review.—List of the Coleoptera of Sheppey, J. J. Walker, $H.D.$		147
SUPPLEMENT British Noctuae, H. J. Turner, F.E.S., F.R.H.S.	(245)-(2	48)

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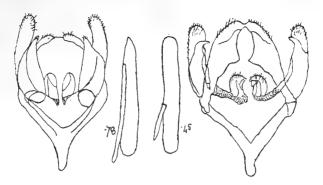
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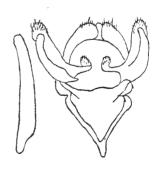
PSYCHIDEA NUDELLA.



ACENTRA VESTALIS.



BIJUGIS PECTINELLA.



EPICHNOPTERYX

The Entomologist's Record.

del C. R. N. Burrows.

PULIA.

MALE GENITALIA OF PSYCHIDAE.



Notes on the Psychidae. XIII. (With Plate.) By Rev. C. R. N. BURROWS, F.E.S.

(Continued from page 119.)

Passing from the Funeidae, still following Tutt's arrangement, we arrive at the extraordinarily awkward term Epicnopterigidae. This we owe to Hübner, who in his Sammlung (1822) introduced the name Epichnopterix for a certain group of the Psychides, which later proved to be a very mixed lot (Tutt, Vol. 2, p. 348).

Rambur (Cat. Sys. Lep. Andalousie, 1858, p. 314 et seq.) examining Hübner's group, separated certain species which possess a short anterior tibial spur, under the generic name of Psychidea. His words translated read "Thighs and anterior tibia shorter than the posterior,

having a very short epiphysis."*

Most unfortunately, Rambur identified his type, so far as the name is concerned, with pectinella, Schiff., an error which has had unforeseen,

and confusing, results.

Rambur, as a matter of fact, collected entirely in Andalusia. His insect must have been nudella, Ochs. Even up to the date of the publication of Seitz, vol. 2, there would appear to be no record of the occurrence of peetinella in Spain. It is however sufficient for our purpose to note, that the spur in Rambur's Psychidea must be, markedly short. The spur in pectinella is long, and the insect which he examined had a short spur. Nudella does occur in Spain, and is very like pectinella. Nudella is figured by Bruand (Monograph, Fig. 53). Hübner figures pectinella twice. First in 1793, and much later in his Sammlung. The former figure is unquestionably Bruand's nudella.

This mistake in a name has led to repeated error, to which Tutt

called attention (Entom. Record. Vol. 12, p. 168, 1900).

First of all, Dr. Heylaerts in 1879 named the long spurred genus, Bijugis, and later (Ann. Soc. Ent. Belg., May 14th, 1900, p. 189) stiil mislead by Rambur's mistake in identification, places pectinella, and its long spurred congeners in Rambur's short spurred genus, Psychidea, and for the short spurred forms created a new genus,—Rebelia, which must, of course, fall before Rambur's older name. The rest of Hübner's species were left in Epichnopterix. Staudinger (Catalog, 1901) unfortunately follows Heylaerts, as also does Seitz. Staudinger places Psychidea next to Fumea, but his Psychidea is the long spurred genus containing pectinella, and not Rambur's.

Seitz also, gives *l'sychidea* the long spur, and the "cellula intrusa" which really belongs to Heylaerts' *Bijugis*, the long spurred genus. But there are other, and equally important differences between these

genera.

Firstly, *Psychidea*, as separated by Rambur, has its final segments in agreement with *Funea*, and not with *Epichnopteria*.

Secondly, the tibial spur ratio is noticeably different (Psychidea,

33-51, Bijugis, 52-64.

Again Psychidea has the spur short, and no "cellula intrusa." Bijugis has the spur long and possesses the "cellula intrusa," while Epichnopterix has no spur, but has the "cellula intrusa." I am

^{*} This term according to Smith's Glossary of Entomology, means—"A lappet-like process, covering an excavation on the fore tibia of many Lepidoptera." I must confess that I have not discovered this excavation, the cover must be that which we call the spur.

unable to detect the "cellula intrusa" in Acentra. Besides these differences the position of the genera is somewhat critical, and very

interesting.

It will be remembered that there has been some uncertainty in time past as to the continuity of the Psychides. The ancient case of Stainton's "Manual" is an example of this. Tutt was wholeheartedly in favour of considering them to be "one separate, distinct, homogeneous, group of the Lepidoptera," with which opinion I entirely agree.

The genera now under consideration occupy this interesting

position, but require shifting slightly, to bring them into line.

I have therefore thought myself justified in revising Tutt's arrangement, by placing Psychidea next to Funea, that is above Bijugis and outside his Epichnopterygidae, and between these genera I have placed my new Genus Acentra, which is introduced, and defined, in my former paper. This suggested rearrangement will be found in the amended table now provided.

FUMEA.

Psychideidi.

PSYCHIDEA.	Ramb. 1866
62. Sapho,	Mill.
68. NOCTURNELLA,	Alph.
64. NUDELLA,	Och.
v. Suriens, -ntella	Reu.
65. Plumella,	HS.
67. Staudingeri,	Heyl.
v. Majorella,	v
68. MILLIEREI,	Heyl.
69. PLAVESCENS,	Heyl.
ACENTRA,	Burrows.
61. Vestalis,	Staud.
OT. I EDIVIS	Duad.

EPICHNOPTERYGIDAE.

Epichnopteryginae.

BIJUGINAE.

Bijugidi

Bijugis.	Heyl. 1879
57. Bombycella,	Schiff.
v. Rotundella,	Brd.
v. Elongatella,	Brd.
58. Proxima	Led.

58. PROXIMA, Led.
59. PECTINELLA, Schiff.
v. PERLUCIDELLA, Brd.
ALTAICA. Staud.

60. Alpherakii, Heyl. 71. Graecella, Mill.

In the plate attached I have tried to indicate the position. The resemblance of *Psychidea*, Rambur., to *Fumea*, and of *Bijuqis*, Heyl., to *Epichnopterix*. I doubt however whether I have succeeded in marking sufficiently the delicate *Fumea* form, as contrasted with the much stouter *Epichnopterix*.

I have not found the species here discussed to be freely offered by dealers, and imagine them to be difficult to collect. In Chapman's material are a good many cases which agree with those which have been identified, but there is no specimen which can be identified as bred, or collected by him. I have in my collection now 6 specimens of B. pectinella. Such as bear data, come from Hungary, Lautarets, and Vienna, two having been bred.

Of *P. nudelta* I have 5, which come from Fiume, Hungary, and Spain. The larval cases of all these insects so far as I have been able to ascertain (with the exception of *B. bombycella*, which appears to construct a "faggot") would appear to be cylindrical, long, and slender, consisting of silk, intersperced with fine black sand. There is complete absence of an attempt at decoration, in the shape of leaves, and sticks.

I have measured those of Acentra.

- 1. Acentra vestalis 2 females 14+3mm., slender, narrower towards exit.
- 2. ,, 2 males ?15+3mm., stouter, parallel sides.
- 3. I have no case.

7. Polyxena

4. 2 1 male ? 10+3mm., swollen in middle, very pointed towards exit.

As to the genitalia I have made these notes.

- 10 seg. ventral view, conical, very narrow and sharp, edge well infolded, 8th sternite strongly hooked laterally.
- 2. ,, Wide, slightly infolded, Saccus blunt, forward edge lobed.
- 3. ,, ,, Narrower, slightly infolded, Saccus blunt, forward edge not lobed.
- 4. ,, Conical, narrow, slightly infolded, Saccus produced, inner edge not lobed, but with two points.

I observe that vestalis, Staud., appears in the Catalog, 1901, as a var. of Rebelia nudella, but is identified with pectinella, Hüb. It is described as "minor, tota alba.," while nudella is, "cinereus, ciliis alabis."

On the "Illustrations of European Butterflies" by S. L. Mosley (1879-1894).

By CHARLES MOSLEY, M.B.O.U. (Curator of The City of Wakefield Museum and Art Gallery.)

(Concluded from page 127.)

CONTENTS OF VOLUME I.

PAPILIONIDAE	Doritis	Peiris	
Papilio 1. Podalirius 2. Alexanor 3. Machaon 3. Hospiton	8. Apollina PARNASSIUS 9. Apollo 10. Delius 11. Nordmanni	14. Brassicae 15. Krueperi 16. Rapae 17. Napi 18. Callidice 19. Daplidice	
THAIS	12. Mnemosyne	20. Chlorodice	
5. Cerisyi	Aporia (Pieris)	ANTHOCHARIS 21 Polemia	

13. Crataegi

22. Belia

136	ENTOMOLOGIST'S RECO	ord. 15.2
23. Tagis	48. Maturna	ARASCHNIA
24. Cardamines 25. Gruneri	49. Artemis 50. Desfontainesii	87. Prorsa
26. Damone 27. Eupheno	51. Cinxia 52. Arduinna	GRAPTA
LEGRIS	53. Phoebe 54. Didyma	88. Egea 89. C-album
28. Pyrothoe	55. Trivia	
29. Eupheme	56. Deiona 57. Athalia	Vanessa 90. Pólychloros
LEUCOPHASIA	58. Dictynna	91. Xanthomelas
30. Sinapis	59. Britomartis 60. Parthenie	92. V-album
31. Lathryi	61. Asteria	93. Urticae 94. Io
COLIAS	ARGYNNIS	95. Antiope
32. Palaeno	62. Aphirape	Pyrameis
33. Phicomone 34. Hyale	63. Selenis	96. Atalanta
35. Erate	64. Selene	97. Cardui
36. Chrysothome	65. Euphrosyne	98. Ionia
37. Hecla	66. Pales	27
38. Thisoa	67. Chariclea	NEPTIS
39. Myrmidone	68. Polaris	99. Aceris
40. Edusa	69. Freja 70. Dia	100. Lucilla
41. Heldreichi 42. Aurorina	70. Dia 71. Amathusia	T
42. Aurorina	72. Frigga	LIMENITIS
GONEPTERYX	73. Thore	101. Sibylla
43. Rhamni	74. Daphne	102. Camilla
44. Cleopatra	75. ln o	Nymphalia
ii. Gloopittiu	76. Hecate	
DANAIDAE	77. Lathonia 78. Eugenia	103. Populi
DANAIS	79. Cyrene	APATURA
45. Chrysippus	80. Alexandra 81. Aglais	104. Iris 105. Ilia
NYMPHALIDAE	82. Niobe	105. 1114
MELITAEA	83. Adippe	Charaxes
46. Cynthia	84. Loadice 85. Paphia	106. Jasius
47. Iduna	86. Pandora	

CONTENTS OF VOLUME II.

CONT	FIAI2 OL AC	JEOME II.
SATYRIDAE	HIPPARCHIA (SATYRUS)	144. Narica
Melanargia (Arge) 107. Galathea 108. Laschesis 109. Teneates 110. Larissa 111. Hylata	124. Proserpina 125. Hermione 126. Akcycone 127. Briseis 128. Anthe 129. Autonoe 130. Semele	145. Janira 146. Janiroides 147. Nurag 148. Ida 149. Tithonus 150. Pasiphae 151. Hyperanthus
112. Clotho 113. Pherusa 115. A rge 116. Thetis	131. Anthelea 132. Peplopea 133. Agave 134. Beroe 135. Lolaus	Triphysa 152. Phryne 153. Sunbecca
Lasiommata (Satyrus)	136. Arethusa	COENONYMPHA
117. Roxelana 118. Clymene 119. Maere 120. Hiera 121. Megaera 122. Aegeria 123. Dejanira	137. Statilinus 138. Fidia 139. Phoedra 140. Cordula 141. Actaea (142 not figured) 143. Lycaon	154. Oedipus 155. Hero 156. Iphis (157 not figured) 158. Arcanius 159. Leander 160. Philea

	ON THE "ILLU	STRA	TIONS OF EUROPEAN	BUTT	TERFLIES. 1
161.	Dorus	Erebi	TA.	192.	Stygne
162.	Dorinna		Epiphron (Cassiope)	193.	Afra Parmenio
163.	Amaryllis		Melampus	194.	Parmenio
164.	Pamphilus	178	Erinhyle	195.	Manto
1.65.	Thyrsis Davus Typhon	179	Eriphyle Arete	196.	Ocnus
166.	Davus)	180	Mnestra	197.	Ocnus Tyndarus Gorge
167.	Typhon			198.	Gorge
	- J F /	182	Pharte Pyrrha Ceto	199.	Gorgone.
CHION	OBUS	183	Ceto	200.	Goante
168	Jutta	184	Oeme	201.	Rechlini
	Aello		Medusa	202.	Rechlini Pronoe
170.	Tarneia	186.	Pirene .		Neoridas
171.	Tarpeia Norna Bore	187.	Nerine	204.	Medea (Blandina)
172.	Bore	188.	Evias	205.	Ligea
173.	Taygete		Melas	206.	Ligea Euryale
174.	Crambis	190.	Alecto	207.	Embla
	Oeno	191.	Scipio	208.	Disa
				11/1	- 111
	CONTE				
]	LIBYTHEIDAE	238.	Fischeri		Cyllarus
LIBYT	HEA		Trochilus		Melanops
109.	Celtis	240.	Aegon		Iolas
2001	001115	241.	Argus	287.	Alcon
	ERYCINIDAE	242.	Argus Optilete	288.	Alcon Diomedes
NEME		(243)	not figured)		Arion
		244.	Zephyrus	290.	Arcus
210.	Lucina	245.	Pylaon Bavius		
	TVCAENIDAE	246.	Bavius		HESPERIDAE
m	LYCAENIDAE		Battus	Pyrgi	JS (HESPERIA)
Тнест		248.	Hylas	291.	Malvarum
211.	Betulne	249.	Panope Lysimon	292.	Marrubii
212.	Spini	250.	Lysimon	293.	Lavaterae Proto
213.	W-album Ilicis		Rhymnus	294.	Proto
214.	Ilicis	252.	Psylorita	295.	Tessellum
	Acaciae		Pheretes	296.	Cribrellum
	Pruni	254.	Orbitulus	297.	Cynarae Side
217.	Ledereri	255.	Medon (Agestis) Idas	298.	Side
218.	Quercus	256.	Idas	299.	Carthami
219.	Rubi	201.	Hyacinthus Anteros	300.	Alveus
AURO!	TIS	250.	Eros •	301.	Serratulae Calcaliae
	Roboris			302.	Calcaliae
220.	TODOTIS	200.	Eriodes		Andromedae
THEST	ror	201.	Icarus (Alexis) Chiron	304.	Centaureae
221.	Ballus	202.	Amandus	305.	Malvae (Alveolus) Phlomidis
	Callimachus		Agestor		
		265	Hesperica		Orbifer
CHRYS	SOPHANUS	266	Adonis	308.	Sao
	sophanus (Polyommatus) Vigaureae	267	Corydon	309.	Therapne
223.		268	Dorylas	Nison	IADES (HESPERIA)
	Ottomanus	269	Danhnis		Tages
225.	Thersamon	270.	Daphnis Admeyus	311	Marloyi
226.	Hippothoe Eurydice (Chryeis)	271.	Rippertii		•
227.	Eurydice (Chryeis)		Lefebvrei		HILA (HESPERIA)
	Alciphron	273.	Menalcas	312.	Thaumas
229.	Gordius	274	Menalcas Hopfferi		Lineola
230.	Dorilis	1275	not figured)		Actaeon
(231	not figured) Phlaeas		Damon		Sylvanus
	7 700000	277.	Donezelii		Comma
255.	Helle	278.	Argiolus	317.	Aetna*
POLYO	mmatus (Lycaena)	279	Sebrus	318.	Nostradamus
234.	Boeticus	280.	Alsus	Cylco	PIDES (HESPERIA)
235.	Telicanus	281.	Semiargus (Acis)		
236.	Telicanus Balcanica	(282	not figured)	320.	Steropes Paniscus
237.	Tiresias		Coelestina	321.	Sylvius

^{321.} Sylvius * This item is crossed through with ink, and it is written "N. Amer. Sp. Not Europ."

283. Coelestina

237. Tiresias

Newly-described Forms of Species of Lepidoptera found in Britain.

1. Zygaena purpuralis.—In the Int. Ent. Zeit. for December 8th,1931 (Vol. XXV., p. 341) the Oban race of this species is named caledonensis, by H. Reiss. It is characterised by the thin scaling, and the very strong hairs on the thorax and abdomen, and is smaller than the purpuralis from Germany while exceeding somewhat in size the small high alpine race nubigena.

2. Zygaena achilleae.—In the same place the Scottish subspecies of this species is named caledonica by H. Reiss. It is characterised by smaller size, resembles mostly the subspecies alpestris from the high alpine districts of Europe, and has thinner scaling, with hyaline streaks at the base of the hindwings. Ground colour blackish in both sexes without gloss or scattered yellowish scales and distinctly strongly haired. Forewing spots much contracted. Spot 6 small, attached to

spot 5. Hindwings lead coloured with blackish fringes.

3. Zygaena meliloti.—On p. 344 of the same Herr Reiss names the English (Lyndhurst) race of this species as anglica. It is characterised as smaller than the typical form in Bavaria. Ground colour in the 3 s with practically no gloss, but in the females with a slight green sheen. Thorax and abdomen more thickly clothed with hair than in the typical form, comparable with f. nigrina of East Prussia, from which it is readily separated by its much narrower black margin of the hindwings.

In Lamb. for December, Vol. XXXI. p. 199, M. C. Cabeau describes an aberration of Melitaea aurinia as ab. simigracilens. It is characterised by the forewings being of an almost uniform fawn colour with the black markings very thin or quite obsolete; while the hindwings are greyish black with some of the fulvous markings more or less well

emphasised. Rabais-Virton.

In Lamb. for January, Vol. XXXII. p. 3, M. C. Cabeau describes a new form of Arctia caja as ab. flavomacula. This form is characterised by the forewings being white and the dark marking being separate and not united by lines. But the hindwings are orange red; the spots, numbering five, are not of the usual bluish black colour but are of a pale yellow. Caught at Ruffac, Charente, in September, 1930.

Gonepteryx rhamni, L.—In Lamb. for February, p. 38, Herr B.-J. Lempke describes and names two hitherto unnoted forms of this species. (1) ab. 3 aurantiaca, "Ground colour of a magnificent golden yellow." It must not be confused with ab. fervida, Fritsch, in which this coloration is less intensive and confined to the upperside

only. (2) ab. 9 alba, "Ground colour of a pure white."

Melitaea aurinia, Rott., ab. melanoleuca, Cabeau.—In Lamb. for April, p. 76, this aberration is described as an extraordinary mixture of melanism and albinism and is figured on Plate IV., fig. 1. The base and disc of the forewings are black leaving only 2 fawn coloured spots somewhat reddish, while the submarginal area is much lighter and of a yellowish fawn. The hindwings are similarly suffused but the marginal area is not so pronouncedly light. The nervures are all well emphasised with black. On the underside the ground is as above but less emphasised and the submarginal area is greyish. Digne.

Mamestra oleracea, L.—M. Dufrane describes 3 new forms of this species in Lamb. XXII. 81. (1) ab. minor.—of small size. 32mm.

Framiéres, Belgium. (2) ab. nana.—Of small size but the colour that of obscura, Spul. Framiéres. (3) ab. minuscula.—Of the same size as ab. minor but has the colour of ab. obsoleta, Lambl. Framiéres.

Sideritis (Leucania) pallens, L.—M. Dufrane describes 2 new forms of this species in Lamb.—(1) ab. minor, 28mm., with coloration as in the type. Framiéres, etc. (2) ab. nana like ab. minor but coloration

as in ab. suffusa, Steph.

Miana (Oligia) furuncula, Schiff. (bicoloria, Vill.).—M. Dufrane described 2 new forms of this species in the same magazine.—(1) ab. minor, 17mm. in expanse, similar to the form bicoloria, Vill. (2) ab. minuscula, same as ab. minor but similar to ab. rufuncula. Both from Framières.

Rivula sericealis, Scop., ab. ochrea, Cab.—The ground of the forewings deep yellow ochre and not straw-yellow as in the type; the hindwings are of a greyish yellow. Hautes-Pyrénées.

Zygaenae, Grypocera and Rhopalocera of the Cottian Alps compared with other races.

By ROGER VERITY, M.D.

(Continued from Vol. XL., p. 163.)

Melitaea trivia, Schiff., race?—Oulx ("one specimen taken by Mr. Lawson, July 31st, flying with M. didyma"). This information is furnished by L. G. Higgins in The Entomologist, 1930, p. 153, who also says it is "very different from examples from Eastern Europe; a most distinct form." Not having met with this species at Oulx and having two male didyma, which resemble trivia very much, from that locality, I asked Mr. Higgins whether it was quite sure that Lawson's specimen exhibited Riley's distinctive feature of trivia on the underside of the hindwing, i.e., the first row of black dots, beyond the end of the cell, very near and quite parallel to the following row, which is on the edge of the orange band. This is the only character which I have found to be perfectly reliable in separating the two species. His answer was that it is unmistakably present.

Melitaea diamina, Lang (=dictynna, Esp. hom. prim.) eexrge vernetensis, Rondou, race alpestris, Frhst., at Sestrières, and race alpestris, Frhst., trans. ad magnaclara, Vrty., at Oulx (only one male on July 1st and a female on the 17th) and Cesana (males abundant and all very fresh on July 11th; females from the 15th and a few of both sexes still emerging on the 24th).—I have stated in my recent paper on this species in the Ent. Rec. that the race of Sestrières is small and very melanic and that its underside exhibits the features of the Central exerge, so that it corresponds exactly with the broadspread alpestris, Frhst., of the western and central Alps. The Cesana and Oulx race is larger and has broader fulvous spaces, so that it is intermediate between the preceding and the still larger magnaclara, Vrty., of the Maritime Alps. I think the Central exerge of diamina should, taken as a whole, bear the name of vernetensis, Rondou, because it is the first one given to one of its races, although the latter is not a pure strain of that exerge, many individuals showing they carry a strain of the Northern one mixed with it, so that the race is a synexerge, as I have pointed out in the aforesaid paper.

Melitaea (parthenoides, Kef. = parthenie, Auct. nec Borkh. exerge?) varia, Meyer-Dür. race variabella, Vrty.: Clavières, 1800 m. (on July 29th, and, according to Higgins, Sestrières on July 4th).—I have described this race and established its position in the Ent. Rec. of 1931,

p. 152, so that nothing need be added here about it.

Melitaea parthenie, Borkh. = aurelia, Nickerl, race imitatrix, Vrty. Oulx (males already abundant, but all quite fresh, at the end of June and still emerging after the middle of July; females from the beginning of this month and a few still emerging at the beginning of August).—I have already stated in the paper mentioned above that the species is found also on Mt. Musiné, which stands at the foot of the Susa Valley, near Turin, and is about 1000m. in height. I sent specimens from both these localities to Reverdin, who made sure of the species by dissecting the genitalia of several, with a view to discovering whether any belonged to the exactly similar M. britomartis, Assm. race aureliaeformis, Vrty., but it was not found. I have described race imitatrix and its appearance and variations at Oulx in the same paper. I must record here an aberration, in which the fulvous is replaced by deep chestnut, inclining to chocolate colour, whereas the black pattern is so poorly pigmented that it looks grey; it is a male with the edge of the wings on the right side ill-developed.

Melitaea athalia, Rott., exerge helvetica, Rühl = pseudathalia, Reverdin, race celadussa, Frhst.—Oulx (males from June 30th; females from July 4th; on the 20th this species had nearly entirely disappeared, but a few sporadic females still emerged till the 28th); Česana (a few still

fresh at the beginning of August).

Melitaea deione, H. G., race berisalii (spelt with a double i in the original description), Rühl.—I have not met with this species, but Higgins informs us in The Entomologist of 1930, p. 153, that he has collected at Oulx, on July 3rd, one worn example at about 3000 ft., which he cannot separate from those he has from Martigny. If the genitalia and other specimens confirm this diagnosis, it will be an interesting discovery, as berisalii was only known from the Valais and the deione of Tessin and the Alto Adige stand nearer to the nominotypical race of the species than to it. Whilst race tessinorum, of Biasca, is described as a transition to berisalii by Fruhstorfer, nobody seems to have noticed that in the Maritime Alps there exists another very fine race, transitional to rondoui, Obth., of Gédre in the valley of Saint-Sauveur (Hautes Pyrénées), and to the, more or less, similar signata, Sagarra, of Catalonia (Seva), which could easily be mistaken for the athalia of the same region, owing to their heavy black markings and their deep fulvous. The original figures of the species in Hübner's magnificent plates represent a very extreme and rather unusual form of both sexes, from what, one may be sure, was a remarkably arid locality: the size is strikingly small, as compared with the usual, normal, one of the lowlands of southern France, but not as much so, especially in the male sex, as in the tiny dejonella, Vrty., of the second generation (the length of forewing from base to tip measures 20mm. in Hübner's figure, whereas in my typical series of dejonella from Marseilles it measures 18); the tone of the fulvous is very pale and cold; the black markings are extremely thin and notably the central elbowed row of spots are reduced to a degree one seldom meets with. Hemming, in the Trans. Ent. Soc. London, 1931, p. 504, points out

that, on the strength of a statement of Duponchel. Hübner's specimens must have been from "Aix-en-Provence." There remains to be seen whether Hübner's form ever is so constant locally as to constitute a peculiar race; anyhow, I think it will be useful to distinguish the usual, larger, brighter and more bodly marked form by the name of **praestantior**, taking as typical a series of specimens collected for me by Foulquier at the well known Sainte Baume,

in the Var, on May 20th.

The race of the Maritime Alps, mentioned above, as represented by a series collected by C. Höfer at Saint Martin de Vésubie, at the beginning of June, and again from August 10th to 27th in the second generation, is constantly, in all the specimens, and markedly distinct from praestantion, of the Var, and can be described as a further degree in the direction of rondoui and signata to which it is a near approach. Both generations are distinctly larger than the corresponding ones of the Var and the first is, in fact, as large as magna, Seitz, of Andalusia, the male's forewing measuring 22 and the females 22 to 23mm.; the fulvous is of a rich, warm and bright tone; some females are handsomely variegated in that this colour is alternated with a vellowish fulvous in some of the spaces; both the basal suffusion and the rest of the black pattern are always much more prominent than they ever are in praestantior and thus resemble some rondoui and signata, and even berisalii, except for the peculiar broad black marginal band of the latter, which does not exist at all; the underside does not differ much from that of praestantior, and there is no tendency on this surface to the prominent markings of berisalii. I propose naming this fine race yesubiana and its small second generation (male 18, female 18 to 20mm.) vesubiella. The latter, compared with the former, exhibits no tendency to a reduction of the black pattern, as does dejonella compared with praestantior.

As I am dealing with this species I must also note that, now Ribbe has made it clear that magna, Seitz, is the Andalusian race of deione and not athalia, Oberthür's name of nitida, given to the Algerian race, which is exactly the same, makes it a synonym, as Seitz's was published on October 7th and Oberthür's in June of the same year, 1909. I cannot agree with Ribbe that magna is a synonym of nevadensis, Obth.: the original figure of the latter is exactly like one of my resubiana and it must apply to the mountain race, whereas nitida = magna is the larger one, with broader wings, a brighter colouring and a very thin black pattern, of the lowlands of southern Spain; I possess it from Murcia.

Boloria euphrosyne, L. race neston, Frhst. Oulx (beginning of June) and along the path from Jouvenceau to Notre Dame des Broussailles (beginning of July); race euphrosyne, L. Cesana (July 11th), Clavières (July 29th) and Sestrières (July 4th, according to Higgins).—I have shown in my recent paper on this species that in the drier and warmer valley of Oulx a race similar to the neston of Tessin is produced, whereas, further up in the mountains, from Cesana, one meets with a distinctly different one, which is quite similar to the nominotypical one of Sweden.

Boloria pales, Schiff. race palustris, Frhst. Clavières (both sexes emerging on July 29th); Sestrières (swarming on August 8th, from very worn to perfectly fresh conditions).—I have discussed this race, together with other cases afforded by this interesting and somewhat

puzzling species, in a monograph on this subject, published in the "Iris" of September, 1932. It unquestionably is, on the whole, a true palustris, but I have pointed out that some specimens, to my mind, distinctly betray a strain of brogotarus, Frhst. = tendensis, Higgins, so that this is one of the reasons, which scarcely admits considering the latter as belonging to a distinct species, according to Higgins's view (The Entomologist, 1930, p. 199).

(To be continued.)

OTES ON COLLECTING, etc.

M. (E.) JURTINA SPLENDIDA, B. WHITE. REPLY TO MR. LEMPKE.—Mr. Lempke has only to consult the Entomologist, LXIII., nos. 802, 803 to find an account of Buchanan White's insect 'Epinephele jurtina ab. splendida,' which is there proved to be a good subspecies. Since the paper was published I have visited Longa Island and Gairloch. and taken splendida in fair numbers. It is unmistakeably a subspecies and when seen in flight looks much darker than the ordinary S. English jurtina.—P. P. Graves (F.E.S.).

Another Literary Curiosity.—Another loss for Parisians. Paris without butterflies is inconceivable. It is a prospect calculated to bring infinite sadness to the entomologist, and nothing short of consternation to the Secretary of State for Tourist Propaganda. But it is a dread possibility serious entertained, it would seem, by expert Nature observers.

According to one of these, M. Gérard d'Houville, the beautiful insect is this year a rare sight in the gardens of the Luxemburg and the Bagatelle Gardens of the Bois de Boulogne. M. d'Houville remembers years when his eyes were gladdened in these delightful resorts by great flights of butterflies. He recalls a night of long ago when André Gide offered him a superb specimen that he had captured on an electric globe in the Rue Royale.

To the plaints of old Parisian about the demise of famous cafés and of familiar boulevard landmarks, and about the decay of manners, there may now have to be added yet another variant of the poignant familiar line—"Où sont les papillons d'antan?" ("Where are the butterflies of yester-year?"—"D.T." 18.vii.32.

WURRENT NOTES AND SHORT NOTICES.

A meeting of the Entomological Club was held at Speldhurst Close, Sevenoaks, on July 9th, 1932, Mr. H. Willoughby-Ellis in the Chair. Members Present in addition to the Chairman:—Mr. Robt. Adkin, Mr. Horace Donisthorpe, Mr. Jas. E. Collin. Visitors Present:—Mr. L. W. Adkin, Maj. E. E. Austen, Mr. H. W. Andrews, Mr. E. C. Bedwell, Mr. F. W. Frohawk, Dr. K. Jordan, Mr. Hugh Main, Mr. J. F. Perkins, Mr. W. Rait-Smith, Capt. N. D. Riley, Mr. H. J. Turner.

The members and visitors arrived at 3 o'clock and were received by Mr. and Mrs. Willoughby-Ellis. The Chairman's Museum was open for inspection, which included his re-arranged collection of British

Butterflies in 160 drawers, the British Moths in 60 drawers, British Hemiptera and British Coleoptera. Mr. Hugh Main brought a number of newly-hatched larvae of the Cetoniid beetle, Gnorimus nobilis, in their pabulum of decayed brown mould, from an oak tree, in which the eggs were laid. Tea was served on the lawns at 4 o'clock, after which, in brilliant weather, a tour was made of the gardens and woods. Supper was served at 6.30 p.m., and the party dispersed about 11 o'clock. Some of the guests remained at Speldhurst Close for the week-end, and on Sunday morning Darenth Wood was visited in very hot weather. The portions of the wood which still remain are very much overgrown, and considerable difficulty was experienced in proceeding from one part to another; insects were found to be somewhat scarce. Byctiscus betuleti and many other species of Coleoptera were captured, amongst which was a very white variety of Strangalia armata.

The Members of the Club took the opportunity of their meeting together to join in sending its congratulations and good wishes to Mr. Robert Armstrong Adkin, the only son of Mr. and Mrs. R. Adkin, senior member of the Club, on the occasion of his marriage to Miss Eileen Marguerite Melvill late of Johannesberg, S. Africa, at the same time presenting the bridegroom with a clock suitably inscribed. Mr. R. A. Adkin has for many years past assisted his father in the meetings of the Club at Eastbourne. He takes a particular interest in the Mollusca.—H.W.-E.

The volume of the Ann. Soc. ent. France for 1932, contains articles on the Faunas of the Azores Islands and the Mascarene Islands, dealing with spiders, Orthoptera and Coleoptera. There are six plates, one coloured. The format of this journal is now quarto.

We have to thank Dr. F. Heydeman for various separates of his writings. In *Ent. Rund.* of the present year he has been dealing with Lycaenid species of the Palaearctic Fauna. His articles are very thorough and all palaearctic students should consult them for the results of his study.

L'Amat. de Pap. for March has an account of Lanslebourg as a good collecting ground by M. Catherine. More than once both Dr. Chapman and Mr. J. W. Tutt spent many days in this neighbourhood.

We have received a copy of no. 1 of the Journal of the Entomological Society of the South of England. In addition to the valuable Transactions which this Society is publishing year by year, this new journal has been established to take the smaller communications of local value and interest, which may not be of sufficient comprehensiveness for the former. The Society does not intend to publish it as a journal of proceedings at their meetings, but it will contain each year the list of officers, a list of members and their addresses, a financial statement, and other matters of general interest to the Society. The issue will, we understand, be at regular intervals. There are no less than 36 items contributed by sixteen members the subjects being mostly of the "other orders" six only being purely lepidopterous in content although two, such as the interesting note by Prof. E. B. Poulton, deal in part with lepidoptera. Needless to say the general get up of the journal is admirable. The progress and usefulness

of this Society has been wonderful since its inception some 10 years ago and is a great credit to all concerned in its management. The position it has so quickly attained is a measure of the importance of entomology in itself, and indicates that it is not in anyway necessary to tack the subject on to general zoology to make it an attractive and successful branch of natural science. It can stand on its own basis. We wish it all the future it so well deserves.

In the February no. of Lamb. Herr. B.-J. Lempke discusses the variation which has been recognised in Gonepteryx rhamni. He divides the aberrations into four groups to which he adds the races recorded. Those species in the first group have developed an orange ground colour above with a tendency more or less to reddish and are eight in number, which the writer reduces to three. Those in the second group have the basic colour of the other sex. Of these there are three. Those in the third group are aberrations of the underside, four in number. Those in the fourth group are six aberrations not classed in the other three groups. The races are two besides the typical one.

The species of the genus Cacullia are considered by A. Dufrane in the March no. of Lamb; especially the closely allied species or forms C. verbasci, C. lychnitis, and C. scrophulariae, but the difficulties remain

unsolved still.

In the same no. of *Lamb*. Command. de Sandt contributes an article "Some figures" in which he gives some appalling calculations on the results of the present extreme desire to enregister the aberrations in

the Lepidoptera.

AN EXTRACT.—A Diagram speaks for itself but it is not always one can carry it around with one so that it may be handy to show to friends. "However, Nature has built a copy of this into each of us. Stretch your arms out horizontally at your sides. Now, if you take the distance between the tips of the fingers of your outstretched arms as representing the number of different kinds of animals living to-day, the last joint of the middle finger of your right hand will represent the number of different kinds of mammals. The middle joint of that finger will represent the number of different kinds of reptiles and their The first joint of the same finger will represent the number of different kinds of birds; and the distance from the knuckles to the wrist will represent the fishes. In other words you can hold our socalled zoological gardens and their aquarium annexes in one hand. The length of one fore-arm from the wrist to the elbow would, on the same scale, represent the number of the different kinds of spiders, worms, known protozoa and all other invertebrates which are not insects. And you have left the distance from that elbow to the shoulder across your chest, and out to the tips of the outstretched fingers of the other arm to represent the number of different, already described, insects now living on this earth. What right has any man to call himself a zoologist who does not know a bug from a beetle?" From an Address given by Frank E. Lutz to the Entomological Society of Ontario And yet we entomologists allow ourselves to be "ruled" by a relatively small section who do "not know a bug from a beetle," the so-called zoologists. We let the tail wag the dog.—Hy.J.T.

A FLY VISITATION.—Motorists on the coastal road near Mablethorpe, Lincolnshire, were recently held up by a swarm of flies. There were

many species amongst the swarm. They came apparently from the sea, and by the time night fell they had mostly disappeared.—The Motor.

Those who take an interest in our British species Miana (Oligia) strigilis should read Dr. Heydemann's thorough discussion of that and the closely allied species, M. latruncula, M. fasciuncula and M. versicolor, Bork. This last he says is Tutt's form virgata. The paper is illustrated by 2 plates. Unfortunately the results of the author are not summarised in our notes on British Noctuae as they were published after our own notes had appeared. Dr. Heydemann's paper appeared in the Ent. Zeit. for April, May, June, July.

A further portion of the Schmett. Südbayerns, Heft 4, Geometers (continued), has been received, as a supplement to the Mitt. Munch. Entom. Gesellschaft. There are 2 photographic plates, 47 figs. of local forms and a number of new aberrations and races are described in the text. Those of species occurring in Britain will be dealt with later.

Parnassiana—a magazine devoted solely to the restricted genus Parnassians and one or two allied genera which are more closely allied to it than to any other, has reached the end of its first volume in 8 numbers from June, 1930, to November, 1931. It contains 2 plates and 34 figures, and is probably a magazine with the most restricted outlook known. A register of an extreme example of specialisation.

Our correspondent Herr Warnecke of Kiel has kindly sent us a copy of the first portion of his work on the Noctuidae of the Hamburg-Altona area. His work on the Macro-lepidoptera began in 1924 with the butterflies and the present section is the fifth in order. The order of Staudinger's Catalog 1901 is followed with Warr.-Seitz corrections in nomenclature. The new forms of any species occurring in Britain will be recorded later. The author treats latruncula and fasciuncula

as separate species.

One of our contributors, Herr B. J. Lempke of Amsterdam has sent us his summary of the history, relationship and variation of Colias croceus in which he has followed the action of the more advanced entomologists in treating croceus as a subspecies of Colias electo, L. ["Colias electo, L. subsp. croceus, Fourcr. (edusa, Fb.)."] Descriptions and notes are given of no less than 30 forms 2 of which are new. The paper is published in the Entomologische Berichten for May. He refers to the statement of Kloss and Hannemann in Supp. Ent. that the genus name Colias properly refers to rhamni, etc. and that Eurymus, Swains., is the correct genus name for croceus, etc. Unfortunately the average British reader is handicapped by his ignorance of the language in which this most useful paper is written.

A copy of the Hastings and E. Sussex Naturalist, Vol. IV., No. 5, lies before us. A very interesting and useful local magazine of a seaside resort dominated, as it should be just now, by the subject of Immigration, for which our friend Capt. Dannreuther is largely responsible with the paper he read on March 3rd. The rest of the pages contain useful records in all branches of natural history, but in the List of 18 species of Butterflies observed on July 31st at that famous collecting ground, Abbott's Wood, surely, it only for the education of the younger members, the nomenclature and spelling should be up-to-date. H. thaumas for more than 20 years has been H. flava, and E. janira has been E. jurtina, the prior names. Sibylla

should be sibilla, galatea should be galathea, hyperanthus should be hyperantus; all the prior spelling. In another page we have the

variation sybilla!

We noticed Dr. F. Heydemann's exhaustive paper on the Hydroecia nictitans Group of species while it was in course of publication. The author has now sent us a copy of the completed paper with the 6 plates. Four species are recognised: oculea, L. (1761), with form nictitans, Bork. (1792); fucosa, Freyer (1830), with subsp. paludis, Tutt (1888), and subsp. pallescens, Stdgr. (1899); lucens, Freyer (1845); and crinanensis, Burrows and Pierce (1908).

It is often the case that first class work is done by members of a local society but that want of funds make it impossible to publish the records of such and there the matter ends. With the Entomological Society of the South of England such appears not to be the case for there lies before us Pt. 2 of the Transactions of the Society for 1931 and Pt. 1 of the Journal for 1932, both recently issued. The former contains three excellent papers. (1) "A Biological Survey of the Megaloptera—Neuroptera of Hampshire and the I. of Wight "by Fred J. Killington, F.E.S. (2) "Observations on the Wasp Mellinus arvensis," by B. M. Hobby, M.A., F.E.S. (3) "An Annotated List of the Coleoptera of Sheppey," by Jas. J. Walker, M.A., R.N., F.L.S., F.E.S. All of outstanding merit and usefulness. The Journal contains some 36 extended Notes and Observations by no less than 18 members, relating mostly to the area of operations of the Society. These notes are of a high level and such as we would much like to see in our three entomological journals where they would most propably have the more extended circulation which they are quite worthy of.

In the Bull. Soc. Ent. de France M. Le Charles describes and figures the abnormally bifid antennae of a Zygaena occitanica and Ortholitha mucronata (plumbaria) with a supplementary lower left wing

perfectly developed and of almost normal size.

In a recent number of the Bull. Soc. ent. Bulgaria, Herr Drenowski makes a comparative investigation of the butterfly fauna of the Bulgarian High Mountain Regions. Unfortunately the paper is written in the Bulgarian tongue, but an admirable summary has been given in German. The species recorded are mostly alpine and racially differ from the typical alpine forms, e.g., Erebia tyndarus var. balcanica, Coenonympha tiphon race rhodopensis, Erebia lappona, E. tyndarus race ottomana, E. gorge race peronica, Psodos trepidaria, Titanio phrygialis, T. schrankiana, Brenthis pales race balcanica, Gnophos myrtillata, Pararge hiera, etc.

In another paper in the same number Herr Tuleschkow discussed the species of lepidoptera discovered from 1928 onwards new to the Bulgaria area. The account describes and announces two new forms: (1) Agrotis lucernea subsp. bureschi, and (2) Plebeius orbitulus subsp.

rebeli.

On p. 95 of Lamb. Herr B.J. Lempke points out how ignorant we still are on the biology of Colias hyale. He collates the various notes published in recent years in what stage hibernation takes place, when the larva appears and how many broods occur per year, and finds no agreement and no probable solution.

REVIEWS 147

REVIEWS AND NOTICES OF BOOKS.

An Annotated List of the Coleoptera of the Isle of Sheppey. By James J. Walker, M.A., R.N., F.L.S., F.E.S., etc. Reprinted from the Transactions of the Entomological Society of the South of England. 7 (2) 81-140, June 1st, 1932, with Map.—This excellent and interesting little production is not a mere list of names but, as its title denotes, an annotated list, giving full information about many species, and at least how all are It is also of much historical value, many of to be found. ancient coleopterists of the past being referred to, and their doings in the Isle of Sheppey mentioned. It is probable that only the author with his special knowledge of this locality and the many years he collected there, could have written it. Sheerness is his native town, and was his home and headquarters until the end of last century during the intervals of his naval service abroad.

The map of the Island is very clear and well executed. In the Introduction the physical features of the Island are dealt with, and

some historical facts are mentioned.

The capture of the beautiful little beetle Acupalpus elegans, Dej. (now alas! extinct in Britain) by Rev. Hamlet Clark in 1853 and subsequently by others is referred to here, but dealt with fully in the body of the list. We believe that the author is the only living coleopterist who has taken this beetle in Britain.

The value of such a list as this is greatly increased by the fact that a lasting record of the whole coleopterous fauna is brought together here; as building operations gradually destroy many of the best collecting grounds, many of the rarer species become extinct, and

their occurrence forgotten.

To refer to some of the rarer species:—Acupalpus elegans, Dj.

(p. 76) we have already mentioned.

Amara strenua, Zimm. (p. 89).—It is pointed out that Dr. Power and Dawson captured it in 1858 and the author in 1897. Mention is made that the writer and my old friend the late A. J. Chitty took it with the author in the Iwade Marshes in 1898, 1899. My friend Sir T. Hudson Beare also took it with us, for I have an interesting "snapshot" of Commander Walker and Sir Thomas sitting in the "Lord Nelson" at Iwade. I believe the only other known British locality was Ryde in the Isle of Wight, where it used to occur very many years ago—except that I have recently taken it, in June last, at Port Victoria!

Pogonus luridipennis, Germ. (p. 91), is another fine species, once abundant, which appears to be extinct in Sheppey now. Through the author's kindness I took a nice series in company with Professor Beare near Sheerness in 1897.

Polystichus connexus, Geof. (p. 92), one of the specialities of the Isle of Sheppey. It also occurred in numbers in flood refuse at Iwade, where we found Amara strenua sparingly in 1899. I was very surprised to capture two specimens of this beetle at the roots of a tree in Windsor Forest in 1923.

Berosus spinosus, Stev. (p. 95), another of the Island's specialities; it appears that the brackish ditches in which it occurred are now filled up.

Emus hirtus, L. (p. 102). This grand beetle was first taken in Sheppey in 1859. Many of us, including the author and the writer, are indebted to the kindness of Dr. Malcolm Cameron for the pleasure of taking this insect.

Malachius vulneratus, Al. (p. 123), has only occurred in Sheppey in Britain; the author is the only Coleopterist who has found it in any

numbers.

Haemonia mutica, F., var. curtisi, Lac. (p. 125). For the capture of this very local beetle, which occurs in brackish ditches, the writer is again indebted to the kindness of the author. Stephens records it for Windsor, no doubt erroneously, in the place of H. appendiculata, Pz., though he records that species for Windsor also.

Bayous argillaceus, Gyll. (p. 134). This very local beetle discovered in Sheppey by Messrs. Champion and Marsh in 1869, has been taken in greater numbers in Sheppey than in any other British locality.

Baris scolopacea, Germ. (p. 136), was taken in the Isle of Sheppey by the late Mr. Champion and the author in 1872 and it has occurred in numbers there by sweeping Atriplex portulacoides, L., the Sea Purslane.

The only other known British locality is a salt-marsh near Bosham, West Sussex, where I discovered it on August 19th, 1920 [cf. Ent. Mo. Mag., 57 153 (1921)]. I was collecting there with Mr. P. Harwood and I pointed out that the Sea Purslane, which was growing in the salt-marsh, was the plant on which this beetle occurred in the I of Sheppey, I proceeded to sweep it and immediately captured the Baris.

At the end of the list is a useful table comprising the number of species recorded from—British Isles 3587; Isle of Sheppey 1211; Rochester District 1615; Oxford District 2141; and Wicken Fen. 1044.

I may add—Windsor Forest 1631.

Contributo alla Conoscenza della Biologia dei Rhopalocera IBERICI. (Contribution to the knowledge of the Biology of the Iberian Rhopalocera), by Orazio Querci, published by the Barcelona Museum of Natural Sciences. Vol. XIV. of the Annals.—The MS. of this work of some 270 quarto pages was left behind by the author in 1929 when he went to the United States. Nearly 200 species are discussed from varietal and biological points of view. The remarks on the various broods are very enlightening. He notes for instance that sometimes the common Pierids appear to emerge almost uninterruptedly from April to November. The suggestion is that there are two independent cycles of emergence running contemporary, both having three annual broods, but one cycle is retarded so that while in the one case pupae hibernate in the other the ova hibernate being laid too late to hatch before the winter influence arises. It was unfortunate that the author had no opportunity to correct the proofs, as there are numerous "printer's errors," and the 34 new forms described and named are not in any way indicated. We thank the author for kindly emending our own copy and compliment him on this fine piece of work.—Hy.J.T.

Will readers send us accounts of their doings of the year. These records are most valuable for reference, and many areas are still unworked or unrecorded.

All MS. and EDITORIAL MATTER should be sent and all PROOFS returned to Hy. J. TURNER, "Latemar," West Drive, Cheam.

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EXCHANGES.

Subscribers may have Lists of Duplicates and Desiderata inserted free of charge. They should be sent to Mr. Hy, J. Tunner, "Latemar," West Drive, Cheam.

Duplicates. S. Andrenaeformis, Bred 1928, well set on black pins, with data.

Desiderata.—Very numerous British Macro Lepidoptera.—J. W. Woolhouse, Hill House, Frances Street, Chesham, Bucks.

Desiderata.—Species of Dolerine and Nematine sawflies not in my collection; list sent.—R. C. L. Perkins, 4, Thurlestone Road, Newton Abbot.

Duplicates .- Albimacula*, sparganii*.

Desiderata. — Ova of D.oo. pupae of X. gilvago, D. caesia. A. J. Wightman, "Aurago," Bromfields, Pulborough, Sussex.

Exchanges.—Living Eggs of Catocala fraxini and sponsa, exchange for butterflies of British Isles.—C. Zacher' Erfurt, Weimar, Street 13, Germany.

Duplicates.—Pyralina*, Salicis, Ianthina*, Orbicularia*, Repandata in variety, Doubledayaria, Black rhomboidaria*, Black virgularia* and others.

Desiderata.— Hyale, Welsh aurinia, Polychloros, Tiphon Agathina, Lunigera, Lucernea, Neglecta, Diffinis, Populeti, Gothica v. gothicina, White Leporina, Tridens Putrescens. Littoralis, Typhae v. fraterna, Rurea v. Combusta, Gilvago, Fulvago v. flavescens, Liturata v. nigrofulvata. Harold B. Williams, Woodcote, 36, Manorgate Road, Kingston Surrey.

Duplicates.—A large number of species of European and Palaearctic Rhopalocera and Heterocera.

Desiderata.—All British species especially those illustrating characteristics of an island fauna. Dr. Lor. Kolb, München 54, Dachauer-str. 409, Germany, and Franz Daniel, München, Bayer-str. 77, Germany.

URGENT.—Wanted English (Cumberland) Erebia epiphron. Adequate exchange will be made in European Lepidoptera.—B. C. S. Warren, 14, Avenue de l'Eglise Anglaise, Lausanne, Switzerland.

I am seeking an opportunity of exchanging Macro- and Micro-Lepidoptera with English collectors and beg to send list of duplicates.—J. Soffner, Trautenau (Bezirksbehörde), Bohemia, Tschechoslowakische Republik.

MEETINGS OF SOCIETIES.

Entomological Society of London.-41, Queen's Gate, South Kensington, S.W. 7.

8 p.m. October 19th, November 2nd.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. October 27th. November 10th, 24th.—Hon. Secretary, S. N. A. Jacobs, "Ditchling," Hayes Lane, Bromley, Kent.

The London Natural History Society.—Meetings first four Tuesdays in the month at 6.30 p.m. at the London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, W.C.1. Visitors admitted by ticket which may be obtained through Members, or from the Hon. Sec. A. B. Hornblower, 91, Queen's Road, Buckhurst Hill,

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TO ENTOMOLOGICAL SOCIETIES and MUSEUMS.

BACK VOLUMES OF

The Entomologist's Record and Journal of Variation.

(Vols. I-XXXVI.)

GONTENTS OF Vol. I. (Most important only mentioned.)

Genus Acronycta and its allies.—Variation of Smerinthus tiliae, 3 coloured plates—Differentiation of Melitaea athalia, parthenie, and aurelia—The Doubleday collection—Parthenogenesis—Paper on Taeniocampidae—Phylloxera—Practical Hints (many)—Parallel Variation in Coleoptera—Origin of Argynnis paphia var. valesina—Work for the Winter—Temperature and Variation—Synonymic notes—Retrospect of a Lepidopterist for 1890—Lifehistories of Agrotis pyrophila, Epunda lichenea, Heliophobus hispidus—Captures at light—Aberdeenshire notes, etc., etc., 360 pp.

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Melanism and Melanochroism—Bibliography—Notes on Collecting—Articles on Variation (many)—How to breed Agrotis lunigera, Sesia sphegiformis, Taeniocampa opima—Collecting on the Norfolk Broads—Wing development—Hybridising Amphidasys prodromaria and A. betularia—Melanism and Temperature—Differentiation of Dianthecias—Disuse of wings—Fauna of Dulwich, Sidmouth, S. London—Generic nomenclature and the Acronyctidae—A fortnight at Rannoch—Heredity in Lepidoptera—Notes on Genus Zugena (Anthrocera)—Hybrids—Hymenoptera—Lifebistory of Gonophora derasa, etc., etc., 312 pp.

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CONTENTS

Races, Hy.J.T. Notes on some Devonshire Coleoptera, H. Donisthorpe, F.Z.S., F.E.S. Notes from Spain, Malcolm Burr, D.Sc., F.E.S. 152 Reduviidae collected in Barberton District, E. Transvaal, J. Sneyd Taylor, M.A., D.I.C., F.E.S.. 154 Records of Immigrant Lepidoptera at Hastings, Capt. T. Dannreuther 156 Newly-described Forms of Species of Lepidoptera found in Britain, Hy.J.T. 157 SCIENTIFIC NOTES.—The Biology of Triple-brooded Species, Q. Querci 158 Notes on Collecting .- S. dubius a rare Trichopteron in Windsor Forest, H. Donisthorpe; The Season in Cumberland, C. B. Routledge; Notes on A. atropos in E. Suffolk, 1932, Lt. Col. Hawley; Notes from the Stratford-on-Avon area, etc., P. Siviter-Smith; Notes from Dorset, Robert Troup ... 160 CURRENT NOTES 162 REVIEWS .- Seitz Macrolepidoptera, Supplement, Hy.J.T.; Report of the Eton College N.H.S., Hy.J.T. 164 SUPPLEMENT. - British Noctuae, H. J. Turner, F.E.S., F.R.H.S. (249)-(252)

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Races.

At the request of Mr. Bethune-Baker some while ago I have been endeavouring to trace the specimen of Polyommatus coridon in the Herrich-Schaffer collection from which he drew the figure 500 labelled hispana, without success. During the quest I have received a letter from our old correspondent Signor Querci containing some very interesting facts and suggestions that should be registered for future reference. Signor Querci has been in Cuba and Philadelphia for two or three years since leaving the Iberian Peninsula where he collected for several seasons. He writes from the Academy of Natural Sciences, Philadelphia, U.S.A., as follows:—

"I have carefully searched everywhere but I have been able to find no European butterflies, which might have belonged to Herrich-Schäffer's collection. All the Pocy's specimens are Cuban; there is an explanatory list written by him, but not any list of Palaearctic insects. The main Pocy collection remained at Habana as I have

heard say.

"I am convinced that the specimen figured by H.-S., by the name of hispana, was taken in Catalonia. Probably it was collected by Martorell, when he was a boy. I still possess a series of specimens, taken in September near Barcelona, which look like the type figure. The type of hispana does not belong to the most frequent form, but this often occurs. If you compare Esper's figure of belemia and Hübner's figure of aesculi with specimens we took in Portugal, you will see that the types differ from most specimens we found in the same place whence the types came. Esper's type of proto looks different from every specimen of proto from Portugal I have seen, save 5 specimens in the Museum Bocage at Lisbon. They were taken only a few miles from the place where we found a quite different form in the exceptionally fine spring of 1927.

"The fact is that the so-called "races" are not constant. The larvae fed in a season favourable for vegetation produce bigger examples than when the larvae have suffered from the scarcity of food. The specimens emerging in a hot and dry period are brighter than these,

which have emerged when it is cold and damp.

"The coridon (true coridon) we collected in Central Spain in the very dry summer seasons of 1924 and 1926, look different from Pyrenean specimens, but in 1928 Central Spain was as wet as a marsh. and the covidon (true covidon) from Cuenca does not differ from those in the damp valleys of Catalonia. Most butterflies from Cuenca in the damp summer of 1928, and particularly actaea, statilinus, lachesis, russiae (japygia), iphioides, thetis (bellargus), comma, cinarea, etc., look different from those taken, quite in the same place, in the dry summer of 1926. Most species from the Sierra Nevada in the dry summer of 1926, are showier than in the same place in the damp summer of 1925. The specimens from Sierra da Estrella in the Museum Bocage of Lisbon, taken by Lima and Lemos in 1886, during a very dry summer, are very different from those collected by us in 1927, For instance statilinus in 1886 perfectly agree with allionia, which Fabricius described from Portugal; our specimens taken during a rainy and mild summer, are much bigger and darker.

"At Una (Cuenca), both in 1926 and 1928, we daily collected all

the proto and fritillum, which gradually emerged in a valley near our home. The period of emergence was long, the weather often changed from one day to another. We observed

1. When it was hot and dry most specimens were orange-cinnamon

on the underside of the hindwings.

2. When it was hot and damp the tint was verona-brown, or mikado-brown.

3. When it was mild and dry the tint was cinnamon-buff.

4. When it was mild and damp the tone varied from saccard's-

umber to tawny-olive.

"The reddish underside was much more frequent in 1926 than in 1928; the yellowish underside occurred only in September, 1926, not in August; while in the milder and damper August of 1928 we found

many specimens having a yellowish underside.

"My conclusion about racial names would be, that in many cases the description of a geographical race is but the opinion of an author who looked at a few specimens taken at a given time in a locality. If he had observed another series, collected quite in the same place, but either in another season, or in another year, his description would have probably been different. The material, which I collected, sometimes more than one year in the same place, seems to prove this statement."

Notes on some Devonshire Coleoptera.

By HORACE DONISTHORPE, F.Z.S., F.E.S., etc.

Having paid two short visits to Devonshire this year to collect Coleoptera, my friend Mr. T. H. Edmonds has asked me to put on record the species taken. From June 7th-14th, Miss Kirk and I stayed at Torcross, where we were joined by Mr. Edmonds, and collected at Slapton Ley and other places near by. The chief object of the visit was to take more of the new species discovered last year, viz. Oxypoda maritima, Donis., Scopaeus minutus, Er., Cephennium edmondsi, Donis., C. pallida, Edmonds, and Malachius elegans, Ol.; all except the last

two being again secured.

The following is a list of the species taken :- SLAPTON LEY. Lionychus quadrillum, Duft., running on shingle, and under larger stones. The typical form was very scarce, but the abs. bipunctatus, Heer., and unicolor, Schil., occurred in small numbers. Metabletus foveatus, Geoff. (foveola, Gyll.) was running in company with them, and on June 9th, a specimen was taken in cop. with the ab. unicolor! Oxypoda maritima, Donis., a short series was secured, after very hard work, under small stones and sifting very fine shingle. flavipes, Jh. (halobrectha, Shp.) under shingle, A. euryptera, Steph., and A. atramentaria, Gyll., under flood refuse. Philonthus varius, Gyll., P. bimaculatus, Gr., and Gabrius nigritulus, Gr., under stones. pennatus, Shp. under flood refuse. Othius laeviusculus, Steph., under stones. Scopaeus ryei, Woll., and S. minutus, Er., sifting very fine shingle, the former in some numbers, but the latter very scarce. Paederus riparius, L., and P. fuscipes, Curt., under flood refuse. Cephennium edmondsi, Donis., a short series, after very hard work, under small stones and sifting very fine shingle; Stenichnus pusillus, Müll., ditto, but in some

numbers. Cryptohypnus dermestoides, Hbst., ab. 4-guttatus, Lap., under flood refuse. Malachius marginellus, Ol., some hundreds of specimens were examined in the hope of finding M. elegans, Ol. All the specimens of the former were found to have very narrow borders on the thorax, and I shall shortly publish more on this subject. Psilothrix cyaneus, Ol. (nobilis, Kies) occurred in profusion on the flowers of Thrift, etc.; all green (ab. viridis, Rossi) different shades of blue, blue and green, and deep violet forms occurring. Rhynchites germanicus, Hbst., and Strophosomus retusus, Marsh., sweeping. Apion urticarium, Hbst., on Urtica wens.

Between Slapton Ley and Hallsands, by sweeping—Atheta hypnorum, Kies., A. fungi, Gr., Mycetoporus angularis, Rey., Stenus nanus, Steph. (declaratus; Er.) Phalacrus corruscus, Pz., Lathridius angusticollis, Gyll., Meligethes fulvipes, Bris., Micrurula melanocephala, Marsh., Malachius viridis, F., abundant in a grassy hollow on top of the cliff—at first glance we thought we had got on to M. elegans, Ol.; Bruchus loti, Pk., abundant sweeping Lotus corniculatus; Lamprosoma concolor, Stm., Psylliodes chrysocephala, L.; Barypithes araneiformis, Schr., B. sulcifrons, Boh., and Tychius flavicollis, Steph. (squamulatus, Gyll.). Laccobius nigriceps, Th., not uncommon in a pool in an old

stone quarry.

HALLSANDS. Trechus fulvus, Dej. (lapidosus, Daws.) under large stone on, and in shingle. Gyrinus elongatus, Aub., common in the Ley outside the reeds and in a stream running out of it into the sea. G. urinator, Ill., a certain number of specimens were taken, but only in the water outside the reeds in one spot. This capture is of importance as Fowler writes [Coll. Brit. Isles. 1 213 (1887)] "Very local; recorded by Stephens from Slapton Ley near Dartmouth, but this appears to have been in error, as it has not occurred there since." The only other records I know of are near Newcastle-on-Tyne; Strathglass, Scotland; Kerry, Ireland; Bath; Bodelstreet, near Battle (where I took it with the late W. H. Bennett many years ago); New Forest; and Bude. Atheta graminicola, Gr., and A. clientula, Er., on the wing, A. vestita, Gr., and A. sulcifrons, Steph., in shingle, Scopaeus abbreviatus, Rey., recently added to the British list by Mr. Edmonds, of which some 15 specimens were taken on damp sand under fine shingle; Medon pectiniventris, Donis., recently described by me, of which several specimens were taken under a large stone on and in, coarse shingle.

My second visit was from August 19th-22nd when I stayed with Mr. Edmonds at Totnes. Agabus melanarius, Aub., occurred in some numbers in pools in the sphagnum bog at Haldon Moor. A. chalconatus, Pz., and A. bipustulatus, L., occurred with it, but it is easy enough to recognise melanarius at a glance by reason of its very different puncturation. Crepidodera ventralis, Ill., was swept in plenty off Solanum nigrum at Slapton Ley. Several specimens of a Lema were swept up, which raised hopes of L. erichsoni, Suffr., but eventually proved to be only L. puncticollis (cyanella, L.). Considerable rain spoilt a greater

part of the visit.

Notes from Spain.

By MALCOLM BURR, D.Sc., F.E.S.

After an interval of twenty years it was very nice paying a flying visit to Spain again. I was only there a few days and did not penetrate beyond the frontier village of Port-Bou, but was able to take a few strolls around the rocky cliffs and pick up a few Orthoptera.

The air was fragrant with the aromatic shrubs. Rosemary was the chief, and apparently it is the rocky cliffs of the Mediterranean coast that are the original home of this sweet shrub, as indeed, its name implies, Rosmarinus. Another sweet-smelling herb was a lavendar, Lavandula stoechus, neither so large nor interesting a plant as our garden species, but with a certain reputation. I find from the books that it extends from Asia Minor to the Canaries and was in our pharmacopeia until 1746, while the Arabs still use it as an antispasmodic and expectorant. I found also that the Stoechades, to-day known as Hyères, were so called from the abundance of this herb.

It was October when I was there and the plants were over. thistles were dried up; there was some gorse, without flowers, and a dark green shrub like a broom, with pods, and very hard sharp spikes, Genista scorpius, a member of the same genus as our dyer's weed and needle furze. Here and there was a pleasant green shrub with small red berries, which I was surprised to learn was a pistacio. known the more familiar kind, P. terebinthia, in Macedonia and seen it in the Caucasus, where it grows into a tree, but this was P. lentiscus, the lentisk, a quite important shrub, for it is the source of mastic, an exudation which appears in incisions in the bark in the form of rounded tears, as big as peas, with a glassy fracture, once an important ingredient in medicine. It is still used largely as a chewing-gum and in the form of the favourite drink of the Levantines, and too as a varnish. It is chiefly cultivated in Asia Minor and some of the Greek islands. For some reason Chios was specially famous for its mastic in classical days.

There was a heath, too, Erica arborea, chiefly interesting from its remarkable distribution, for it occurs on Kilimandjaro, where it grows like a gigantic cabbage to a height of twelve feet or more and I rather think it is the same species which forms thickets among which I have hunted Orthoptera on Tenerife. There was also an Euphorbia, much stouter than our English species, but of course far feebler than the

Canary or African kinds.

But the dominating shrubs on those rocky slopes are two species of Cistus, C. albidus and C. clusii. It must be a beautiful sight when they are in flower. Apparently these species are of no particular use, but several of the rock roses give "ladanum," a kind of balsam which was once very highly prized in ancient Greece and still used in perfumery and for making fumigating pastilles. The grey green velvety leaves of these shrubs give the hillsides a characteristic colour, the greyish green tint, suggestive of the olive, characteristic of the maquis. The Spaniards give special names for these plant associations, from the dominant species; thus, the great groves of Cistus are jarales, from jaras, a rock rose, which are in places so extensive as to cover great areas, and give a characteristic appearance to the scenery. The Sierra Morena derives its name from the

dark colour of the extensive thickets of jarales, but what a splendid sight it must be in the spring when they are in flower. Where thyme and the low growing Labiates dominate, they call them tomillares, from tomillo, thyme, with Thymus, Lavandula, Rosmarinus, etc. Both forms seem to be about equally divided on these rocks around Port-Bou.

Here and there was a prickly pear, which fitted in very well with the native scenery, where it is long since naturalised. It is strange that so queer and uncouth a plant should have so delicate a flower,

suggestive of a lemon-yellow tulip.

The scarcity of birds was surprising. There were plenty of insects about and no lack of food. I caught a glimpse of a yellow wagtail and of a lark. A few pigeons sometimes flew over, but these were probably domesticated or perhaps rock doves. One evening a couple of crows flew over the sea, on their way to roost among the cliffs, where here and there a stunted pine was the only tree to offer them a perch.

I was surprised to move a rabbit as no creature could dig a burrow

on those hard rocks.

I picked up a few Orthoptera. The tinkling tintinnabulation of Decticus albifrons, so characteristic of a Meditterranean autumn, at once evoked many memories. He has a strange preference for the thorniest shrubs and driest ground. His colour fitting in well and his great activity made him not easy to catch. The last time I had heard it was at Doiran in Macedonia under very different circumstances. The only other Tettigonid was Metrioptera intermedia, Serv., barely distinguishable from M. grisea, so common in suitable localities along our south coast. Of Mantids I picked up a couple of small Ameles, but Mr. Uvarov, who was good enough to determine these Orthoptera for me, declines to venture on a specific name, so complete is the muddle in this genus. It is an extraordinary thing that even such a marked physical feature as conical eyes have no specific value, as they vary

considerably and seem to pass into the rounded form.

The coloured-winged grasshoppers of course were quite at home on these rocks. There was a Sphingonotus, without smoky bands to the wings, but here again, no one can offer a certain identification of the numerous and apparently plastic species of this extensive and almost world-wide genus. Oedipoda caerulescens, L., with blue wings, and O. germanica, Latr., with red, both quite common central and south European species, were plentiful. The pretty Ramburiella hispanica, Ramn., was fairly common; it is a purely meridional species and seems to prefer the coast, as not penetrating far inland, in Spain, the south of France and north coast of Africa. Stenobothrine grasshoppers, that is the group of true grasshoppers, there were three species, two central European and one typically southern, Omocestus raymondi, Yers. This is closely related to our O. rufipes, but much paler in colour and purely southern in distribution; it is a native of the western Mediterranean countries, where it may be found adult from the early summer to the end of the year. Chorthippus vagans, Ev., was there too, a regular but somewhat localised Central European species which Mr. Uvarov has identified in some British material in the museum. In appearance it is very close to the generally abundant Ch. bicolor. The third grasshopper was Euchorthippus pulvinatus, F.W., which may be found commonly

adult throughout southern Europe from the early summer to the end of the year. I was surprised to find a high proportion of immature

grass-hoppers so late in the season.

Of course, Calliptamus italicus, L., was numerous. This is a remarkable species. The male is about half the size of the female, but both vary extensively in dimensions as well as colour. Brunner has recognised several of these forms by name, but it has been regarded as a single species. However Captain Campbell, an excellent observer, but with no systematic knowledge, noticed in Macedonia that there were two quite distinct races which never met, as they appeared at different times, and now the opinion is in favour of splitting it. Hitherto, only the Canary form, C. vulcanius, Kr., has been recognised as distinct, the Madeiran form being associated to the European. But now it looks as though the Madeiran is really near the Canary one and that the whole group will be split into half a dozen distinct species, or perhaps even more.

I sent the Orthoptera to Mr. Uvarov to be verified. In the bottles with them were a few casuals, four common Rhynchota, Graphosoma lineatum, L., Eurydema ornatum, L., E. festivum, L. and Codophila varia, F. These are very ordinary and call for no comment, but what puzzled the staff at the Museum was a big wasp. This was clearly a species of Belonogaster, a big handsome fellow, but what was he doing in Spain? He caused, in fact, quite a commotion, and they came to the conclusion that it must have been a straggler from the tropics. When I heard this, I realised that I was myself the cause of all the pother. I had used an old killing-bottle that I had last had in my hands in Northern Rhodesia. That wasp must have come from the

Luano Valley, and been lying in the bottle four years.

Reduviidae collected in the Barberton District, Eastern Transvaal.

By J. SNEYD TAYLOR, M.A., D.I.C., F.E.S.

The following twenty-nine species of Reduriidae were collected in the Barberton District, Eastern Transvaal, during five-and-a-half years residence there. As sufficient time was not available in order to make a systematic collection, the list is probably very far from being complete, and it could doubtless be considerably augmented by anyone fortunate enough to be able to devote all his time to collecting in this district, which is so rich in entomological fauna. The majority of the species contained in the list were collected in the vicinity of the town of Barberton, and the remaining few on brief and occasional visits to other parts of the district.

The altitudes of the various localities mentioned are as follows:—Barberton, 2,825 feet; Nelspruit, 2,349 feet; White River, about 3,300

feet; Tonetti, about 1,360 feet.

In five cases, where the specific name is not given, the species concerned were not previously represented in the British Museum collection, while in one instance the genus was also not represented.

I am indebted to Mr. B. P. Uvarov, of the Imperial Institute of

Entomology, for determining the majority of the species.

Tribelocephala boschjesmana, St.—Two specimens obtained at light, October and November, Barberton.

Oncocephalus caffer, St.—Two specimens obtained at light, September and March, Barberton and Nelspruit.

Oncocephalus annulipes, St.-Two specimens obtained at light,

March, Nelspruit.

Varus flavoannulatus, St.—One specimen obtained at light, October, Barberton.

Reduvius tarsatus, Germ.—Common at light, October, February, Barberton.

Reduvius sp. ?—One specimen obtained at light, November, Barberton.

Sastrapoda baerensprungi, St.—One specimen obtained at light, December, Barberton.

Edola sp. ?—One specimen found under a stone, apparently hibernating, July, Barberton.

Acanthaspis obscura, St.—Common at light, November-June,

Barberton.

Acanthaspis lurco, St.—Common at light, October-February, carberton.

Pirates lugubris, St.—One specimen obtained at light, January, Barberton.

Pirates sp. ?—Two specimens obtained at light, March, Nelspruit. Leptodema acanthocephala, Carl.—One specimen found in the house, apparently at light, January, Barberton.

Rhinocoris violentus, Germ.—One specimen found in cotton field,

March, Barberton.

Rhinocoris tristis, St.—One specimen obtained on tobacco plant,

January, Barberton.

Rhinocoris tibialis, St.—One specimen found in house, apparently at light, April, Barberton. (Two specimens obtained on cotton plant, February, Magut, N. Natal).

Rhinocoris albopunctatus, St.—Occasionally found in cotton fields, and on wild plants. Has been observed preying upon Lepidopterous

larvae. October-June, Barberton.

Rhinocoris segmentarius, Germ.—The commonest species met with in the field, it has frequently been observed in association with infestations of cotton, maize, tomatoes, peas, etc., by larvae of Heliothis obsoleta, Fabr. and other Noctuids, upon which it preys. Egg-clusters (Ent. Rec. & Jr. Var. XL., p. 141) have been found on cotton foliage. The species occurs commonly, September-May, Barberton and Tonetti.

Rhinocoris sp.—One specimen found on grass, April, Barberton. Rhinocoris sp.—One specimen found in cotton field, March,

Barberton.

Pantoleistes princeps, St.—Fairly numerous on trunk and branches

of Acacia sp. ?, February, 1928, Barberton.

Endochus cinnamopterous, Dist.—(?) One specimen obtained on citrus tree on which larvae of H. obsoleta were abundant at the time, September, Nelspruit.

Phonoctomus formosus, Dist.—Two specimens found on citrus,

November and February, White River.

Coranus carbonarius, St.—One specimen found under pea plant in the presence of larvae of Euxoa segetum, Schiff., August, Barberton.

Coranus papillosus, St.—A common species found in the field. During the summer it has frequently been observed in cotton fields

where it preys upon "bollworms" and other Lepidopterous larvae. In the winter months it has been found under pea plants in the presence of larvae of E. segetum and Laphygma exigua, Hbn., and also among debris in cotton fields. Barberton.

Coranopsis vittata, Horv.—Three specimens obtained, one on kaffircorn, infested by larvae *H. obsoleta*, one among debris in cotton field, and one at light, January, August, and September respectively, Barberton.

Ploearia hewitti, China.—Three specimens obtained, two at light, and one on grass, April, September, and July, Barberton.

Physorhynchus crux, Thunberg.—Two specimens obtained, one on garden path, and one in house, January, and March, Barberton.

Records of Immigrant Lepidoptera seen at Hastings (East Hill), with dates on which specimens were on the wing.

By CAPT. T. DANNREUTHER.

Pyrameis cardui.—First appearance in Hastings Aug. 3rd (W.F.) Single specimens 12th: 13th: 17th four rosy fresh: 18th two worn: 19th three: 23rd: Sept. 4th three.

Pyrameis atalanta.—May 15th: Aug. 8th seven: 15th: 17th three:

18th four: 23rd: 28th two: Sept. 7th two.

Colius croceus.—Aug. 9th three: 12th: 16th two: 24th. Pieris brassicae.—First appearance May 29th then average.

Pieris rapae.—More abundant than usual but no direct evidence of immigration. In hot spell in August at the maximum 19 summer brood counted feeding on one lavender bush. Few left in Sept.

Pieris napi.—Not common. Seen July 27th: and Aug. 17th two. Aglais urticae.—Common but no indication of immigration. Several taken Aug. 5th and 8th: 17th eight: Sept. 12th two on the beach.

No Hawk-Moths or vagrant lepidoptera seen [exept one Amorpha populi at Battle July 13th, and larvae of Chaerocampa elpenor Aug. 20th (J. E. Ray.)]

Plusia gamma.—Taken in daylight: June 28th: July 28th two: Aug. 6th: 9th: 10th two: 18th seven: 15th fourteen: 16th two: 18th

twenty-one: 19th four: 21st: 24th: 25th: 28th.

Nomophila noctuella.—Sept. 6th. Pionea ferrugalis.—Aug. 16th two.

Dragonflies, probably residents—Sympetrum sanguineum Aug. 25th. Aeschna mixta Aug. 16th: 17th five. (Aeschna cyanea, Sympetrum striolatum, Aeschna grandis, and Agrion puella also taken but not classed as possible immigrants).

Other records reported from elsewhere:-

Colias hyale and C. crocens at Waldringfield (Suffolk) May 13th (Rev. A. P. Waller.)

Pyrameis cardui.— Corton Cliffs. July 5th, three worn. (J.G.)
Pyrameis atalanta.— Norwich. Aug. 4th new brood. (G.J.C.)
Phrywus livornica.— Grantham (Lines.) early June (H. Preston.)

Nomophila noctuella.—Crumbles (Eastbourne) May 28th (H. Main). Wm. Fassnidge wrote from Maurin, Basses-Alpes, on Aug. 29th:—"Glorious weather but a bad season. A few immigrants have shown

up, and last night N. noctuella was in thousands at the lamp and sheet."

Mr. H. Main writes from South Woodford, E. 18, "Nothing but Large and Small Whites on Buddleias but a few P. atalanta in vicinity."

Whenever I obtain migrant species tired or merely fluttering at the flowers they are kept captive until the following morning and then released from a lawn. About half the P. cardui and P. atalanta so released will dart up at an angle of 45 degrees flying fast and straight to the North or N.N.W. (true) thus showing that the urge to migrate is still present though not observed when captured. Others will merely flutter in the vicinity and Plusia gamma will usually remain where released. One very worn P. cardui died in the house before release on August 18th. The specimen was exhibited at the B.A. meeting at York.

Newly-described Forms of Species of Lepidoptera found in Britain.

Phragmitiphila (Nonagria) typhae, Thubg.—M. Dufrane describes two new forms. (1) ab. obsoleta, on the forewings, the black spots before the submarginal line are completely obsolete, or reduced to the merest atoms. Dampremy, France. (2) ab. punctata, on the forewings these same dots are enlarged and very black. Mons. Lamb. XXXII. 83.

Hybernia defoliaria.—Herr Gornik describes and names two unrecorded forms of this species in Zeit. Oestr. Ent. Ver. XVII. 5. (1) ab. destrigata. "The ground colour of the upperside forewing lighter or darker reddish ochre-brown and more or less powdered. But the black brown sharp, transverse streak wanting while the rest of the marking is present, hence the darker brown unevenly wide scaling of the large hinder transverse band shows clearly just as does the smaller more basal line. Thus the enclosed central area becomes somewhat lighter. The discal spots of both fore- and hindwings are very distinct. Fringes unicolorous. Hindwings finely powdered brown." (2) ab. punctata. Like holmgreni, Lamp., but the discal spots of both fore- and hindwings upperside are very distinct.

Metachrostis (Bryophila) muralis ab. vividior.—Herr Schawerda describes and names this form taken at light in Corsica, in the Zeit. Oestr. Ent. Ver., vol. XVII. 30 as intensively suffused with bright

green, above other green examples.

Hadena didyma ab. xanthostigma.—Herr Schawerda also describes and names on the same page an example of this species with the stigmata yellow instead of white as in the well-known form leucostigma. Col de Vizzavona, Corsica.

Metrocampa margaritata ab. rubrociliata.—The same writer names a new form of this species with carmine red fringes on both wings,

taken at light on the Col de Vizzavona, Corsica.

In the Ent. Bericht for May, Herr B. J. Lempke records and describes two new aberrations of our familiar Colias croceus. (1) ab. basisuffusa, an "orange 2 with strongly suffused base." (=ab. suffusa, Tutt, 1896, nec. Cockerell, 1889). (2) ab. rufomaculata, "the double silver spot wholly suffused with carmine red."

Chloroclystis rectangulata ab. ochrea, Derenne, Lamb. (1932) XXXII. 156.—The ground colour of the wings is yellow ochre. Ixelles, Brussels.

Hydroecia fucosa, Freyer (paludis, auct.)—Dr. Heydeman in his masterly paper (Ent. Zeit. 1930) on the nictitans group describes and names the following forms. (1) ab. fucosa-albo, Heyde., "with larger, snow-white reniform stigma, but in which the 2 white spots on the innerside do not uppear quite so perfect and roundish as in oculea, L." (2) ab. intermedia, Heyde., "somewhat darker leather yellow-brown." (3) intermedia-albo, Heyde., "as the last with white reniform." (4) brunnea, Heyde., "dull yellow, often suffused violet-grey in the marginal area, with larger more fully yellow reniform." (5) brunnea-albo, Heyde., "ditto with restricted white reniform." (6) grisea, Heyde., "in which the yellow-brown ground-colour is quite masked by a dusky slight yellowish grey on which the often quite large reniform is clearly evident and yellow in colour." (7) grisea-albo, Heyde. "ditto with white reniform." [rufa, Dadd, and rufa-albo, Dadd, were not recorded in British Noctuae. Without grey or ochre-yellowish tone with deep orange coloured reniform in the former and reniform white in the latter.]

H. fucosa, Freyer, subspecies paludis, Tutt. (1) rufa, Heyde, "pale red brownish with ochre-yellow-toned reniform." (2) rufa-albo, Heyde. "ditto reniform not yellow." (3) obscura, Heyde., "deep chocolate leather brown, without red tone, melanistic, with quite narrow streak-

like reniform."

H. lucens, Freyer. (1) ab. brunnea, Heyde. "brown to dark leather brown without red tone in the disc and with mostly dark grey hindwings and red ochre fringes. Yellow reniform." (2) ab. brunnea-albo,

Heyde. " not yellow reniform."

**Coremia (Ochyria) spadicearia (ferrugata, Clrck.) ab. extrema, Schneider.—In Ent. Runds. XLIX. 145 (1932), Carl Schneider describes and figures this new form. "Forewings:—basal area normal, central band wholly obliterated by the encroachment of the adjoined markingless grey outer area. Hindwing markingless as well as the whole undersides of the wings." Cannstatt, Würtemburg.

In the Ent. Ziet. XLVI., p. 112 (1932) Dr. Przegendza of Nürnberg describes and names new races of Zyyaena species. Z. purpuralis race (subsp.) erythroides from Managgio. "Middle size, with very broad bright red forewing marking. The central wedge spot is much enlarged and cut off sharply. The wings are narrow of a dull black ground without gloss. In 33% the forewing marking is so much enlarged that only a small area of the black ground colour remains." Z. purpuralis race (subsp.) kijevana. "Scaling of the 3 thickly overspread with dull bluish black gloss, the 2 thinner scaled and duller in colour. The markings of a clear dark scarlet red colour very regular, but tolerably narrow. Spot 6 short and of oval form united with 5 broadly. Gov. Kijer. There are 4 figs. on plt.

SCIENTIFIC NOTES AND OBSERVATIONS.

THE BIOLOGY OF TRIPLE-BROODED SPECIES.—I have been studying the *Pieris* and other triple-brooded species with the help of Scudder's and Edward's data and the large and magnificent series of specimens, which

I sent here from Spain and Portugal. All these series are here at my disposal and with them at hand I can speak much more fully than in my recently published book. After three years since I wrote at Barcelona the note printed last January I still believe what I then said about the triple-brooded species is right. My hypothesis explains every case.

Everyone says that the *Pieris*, and some other species having more than one brood, pass the winter as a chrysalis. I feel sure that when, in the fall, there is a marked and sudden change in the weather, which continues until the following year, some eggs remain unhatched. They are those only which have been laid in the last week, or so, of fine weather. If a few eggs hatch, the larvae die when the country becomes icy and barren. But both the chrysalides and a few eggs survive. The eggs hatch as soon as the fields become green again, for instance in March, producing a brood in May, a second late in July and in August, and a third late in October. The hibernating pupae, however, produce imagines 20 to 30 days later than the hatching of the eggs, in the warm days of April, with a second brood in June, and a third in September and early October.

Thus sometimes there is a continued emergence of the butterflies from April to November, and we must admit that there exist in the country two quite independent cycles of emergence: viz. that from the hibernating chrysalis and that from the hibernating egg. When the rainfalls are frequent and the country generally verdant throughout the year, we have what appears to be six broods, when really there are only

two sets of three.

It is quite impossible to admit that this second group, which emerge even less than one month later than the hatching of the eggs of the first group may be the descendants of the first. The eggs from the earliest emerged specimens have not time to complete their life cycle in such a short period and while the climate is still mild. Besides that we have sometimes found larvae of *Pieris* in early spring before

any specimen of that genus had emerged.

I came to this conclusion, observing what happens in spring, after a sudden change of weather in the previous fall. In April (for instance) we collected the small and grey forms produced by lethargic pupae: Pieris rapae f. metra, P. manni f. farpa, P. napi f. vulgaris, P. brassicae f. verna, P. daplidice f. bellidice, Colias hyale f. vernalis, C. croceus f. vernalis, Coenonympha pamphilus f. murina, Polyommatus icarus f. vernalis, etc. About 20 to 30 days later than the earliest appearance of these forms and while they were still in full emergence, we found on the wing the showiest forms of the same species P. rapae f. messanensis, P. manni f. secundogenita, P. napi f. atlantica, P. daplidice f. expansa, C. hyale f. calida, C. croceus f. ampla, P. megera f. vividior, C. pamphilus f. australis, P. icarus f. meridionalis, etc. etc.

When the previous fall gradually becomes cold, which allows all the eggs to hatch in the autumn and the larvae to develope pupae that overwintered as such, the showy forms of butterflies cannot emerge, because there are no pupae produced in early spring.—Orazio Querci.

OTES ON COLLECTING, etc.

STENOPHYLAX DUBIUS, STEPH., A VERY RARE TRICHOPTERON IN WINDSOR FOREST.—When fishing for waterbeetles in a stream in Windsor Forest on October 2nd, 1931, I noticed a Trichopteron on the water net. As it looked darker in colour than any other species I had seen at Windsor

before, it was promptly bottled.

Mr. Martin E. Mosely informed me, at the British Museum, that it was a male of the very rare Stenophylax dubius, Steph., of which there was only one example in the B.M. collection, the type, also a male. Stephens described the species from "near London" in 1837, and it has never been taken in this country again until now. The species has been taken on the Continent in Germany, Galicia, Croatia, Finland, Russia and Courland.

On September 18th this year when sweeping long grass, etc., in another spot in Windsor Forest, but near to the same stream I captured a second specimen which Mr. Mosely tells me is a female, and of course that sex has not been taken in this country before.—

HORACE DONISTHORPE.

The Season in Cumberland.—Lately I have been sugaring the trees. Amathes litura, Scopelosoma satellitia, Orrhodia tigula, O. vaccinii, and A. circellaris are about at present (October 11th). On October 2nd I took Calocampa vetusta my fourth example in Cumberland. I mostly take C. exoleta here. We have had a bad summer, wet and frosty nights must have been bad for the summer larvae. Of course larvae that hibernate can stand the cold.—G. B. ROUTLEDGE (J.P., F.E.S.), Tarn Lodge, Head's Nook, Carlisle. October 11th.

Notes on A. atropos in East Suffolk, 1932.—I came here on August 17th, and the same day 2 larvae of A. atropos were brought to me from the village of Orford. I imagine that these had been dug up with potatoes, as they immediately burrowed when I gave them the chance. Another larva was brought to me on September 10th, about ²/₃ grown. I then made a personal search and secured 12. were brought to me, until I at last had about 30. Several of these had been dug up while pupating, and 3 or 4 of them died, but the others, though unable to burrow or form their earthen case, succeeded in pupating when placed in a hollow on damp sand, and covered with At this time most of the potato leaves had died down and the larvae were, I think, underfed while in the open. The pupae seemed The only pupa brought to me was received on September 19th from a village boy. This produced a good medium sized 2 on October Of the larvae which pupated in captivity, none has so far attained the perfect state. I have never seen it noted that this larva makes a peculiar sharp clicking sound when disturbed. Of all the larvae seen, only one was of the dark form. The remainder were of a brilliant green ground colour.—D. G. B. HAWLEY (Lieut.-Colonel), October 17th, 1932.

Notes from the Stratford-on-Avon area, etc.—The output of useful entomological work has diminished tremendously since the death of Tutt; how he ever found the time necessary for his work I don't know.

I have been having a very interesting ten days at Bourton-on-the-Cotswolds, but the good Noctuae are just arriving as I have to leave. I have been quite successful in getting pupae of Hydraecia petasitis, which occurs there, but I am afraid a large percentage of them come out crippled. I have had a few nice ones so far. I have tried sugar and light for them, and also took down a crippled ? but I could see no imagines at all. Barrett says they fly at dusk, but I could not confirm it, and I don't think it has been confirmed anywhere.

I caught an interesting Noctua at sugar which appears to be a second brood of Mamestra (Hadena) thalassina, Rott., but when it is set I will let you see it as it may interest you. It is not at all like ordinary thalasina, having a broader forewing and a more rosy tinge

over the whole. The hindwings are much darker too.

C. xerampelina was just coming to sugar and I got one female at light. At light also I got Luperina testacea of course and a single

Ennomos fuscantaria, which is rare in the district.

One Triphaena orbona, Hufn. (subsequa, Hb.) came to my sugar, but I believe Col. Donovan has had several this season. A very interesting visitor was the var. suffusa of Polia chi, and another between that and the type, which is of course common in the district.

My friend Col. Donovan has been very successful in Ireland this year getting three larvae of *Leucodonta bicoloria* and other prominents, not, I think, recorded in Ireland before. A note about them will

appear soon I fancy.

It is a bad year for immigrants, but I caught a splendid P. cardui on the Cotswolds which is rather nicely coloured.—P. Siviter-Smith, Pebworth. August 31st.

Notes from Dorset.—On August 1st I visited our local colony of Polyommatus (Agriades) coridon, but found none on the wing, owing, no doubt, to the lateness of the season and the site being some 600 ft. above sea level. On August 20th I again visited this site and found P. coridon on the wing but very scarce; P. icarus, Plebeius medon and Coenonympha pamphilus were also flying, the slope being covered with Hippocrepis, Lotus and Helianthemum. I took about a dozen very ordinary & and P. coridon as I wished to procure some ova to breed from, and was on the point of leaving when, what I took at first sight for a moth, got up in front of me. On netting it I found it to be a worn pathological specimen of coridon corresponding almost exactly with the description of specimen (on p. 7 of Tutt's British Butterflies, vol. IV. 2 diameter 38 mm. The forewings are the same pale fawn tone as the hindwings but in some lights look much paler. Fringes worn, hairs on wings in good condition. Hindwings each with a small piece missing. Underside also pale fawn, fully spotted, orange lunules rather pale. As this ? had evidently laid most of her ova I set her rather than risk further damage to her wings. I hope to visit the locality next year and work for her offspring if any. I again visited the slope in September but coridon was no longer on the wing, my only capture being a ? Rumicia phlaeas which gave me a good batch of ova.—Robert Troup, Buckland Newton, Dorchester. October 24th.

CURRENT NOTES AND SHORT NOTICES.

A meeting of the Entomological Club was held at 52, Oakhill Road, East Putney, on September 21st, 1932, Mr. H. Donisthorpe in the Chair. Members Present in addition to the Chairman:—Mr. H. Willoughby-Ellis, Mr. Jas. E. Collin, Mr. W. J. Kaye. Visitors Present:—Sir T. Hudson Beare, Mr. K. G. Blair, Dr. M. Burr, Dr. E. A. Cockayne, Mr. F. W. Edwards, Dr. K. Jordan, Mr. M. E. Moseley, Mr. W. H. T. Tams. The meeting was called for 6.30 p.m., and the members and guests were received by the Chairman, when tea and light refreshments were served. A retirement was made to the Chairman's study, where his collections and recent work were inspected. His method of filing notes and separata in the Orders in which most of his work has been done, which enables any reference to be found within the space of a few minutes, was greatly admired and appreciated. Supper was served at 8 o'clock, after which the Chairman made the following exhibits:—

Scopaeus abbreviatus, Rey., a Staphylinid beetle taken at Hallsands, S. Devon, 12.vi.32, new to Britain, taken by Miss Kirk and Messrs. Edmonds and Donisthorpe. The first named found the first and most of the specimens. Next day Mr. Keys joined the party and more specimens were taken. Recently further captures have been made by Messrs. Edmonds, P. Harwood and Sir T. H. Beare. Medon, n. sp. A specimen was taken at Hallsands, S. Devon on 12.vi.32., by Mr. Donisthorpe in fairly coarse shingle. Subsequently Miss Kirk took a second specimen, and recently Messrs. Edmonds, Harwood and Sir T. H. Beare have made further captures. Stenichnus, n. sp. A number of specimens were taken at Slapton Ley, June 8th-12th, 1932, in fine shingle on turf. A very pleasant and interesting evening was spent.—H.W.-E.

The Insect Immigration Committee of the South-Eastern Union of Scientific Societies request that all who have been supplied with the standard Immigrant Insect Record cards since April 1st, 1932, will send in any filled in records (with specimens if available), in time to reach the local Recorder for the County, by November 1st, annually (or if his address is unknown, to Captain T. Dannreuther, R.N., "Windycroft," Hastings), in order that Recorders may complete their lists by November 10th.

As negative evidence is of value, it is requested that if it can be definitely stated that any of the common immigrant species were absent from the observer's district during 1932, that the word "Absent" may be against it in the list given below, and the list returned to Recorder.

LOCALITY:—Painted Lady, Pyrameis cardui; Red Admiral, Pyrameis atalanta; Clouded Yellow, Colias croceus or edusa; Pale Clouded Yellow, Colias hyale; Silver Y Moth, Plusia gamma; Diamond-back Moth, Plutella maculipennis; Rush Veneer Moth, Nomophila noctuella.

Vol. XXVI. of the Boll. Lab. Zool. Gen. e Agraria issued by the Institution at Portici, contains the usual well done and adequately illustrated memoirs of the original work done by the able staff, under the Directorship of Prof. Silvestri. The papers are devoted to Coleoptera 2, Diptera 2, Hymenoptera 2, Isopoda 3, Hemiptera 2, Thysanura, etc. There are 2 plates with nearly 60 figures of galls and most of the papers are illustrated by a very large number of figures. The volume is very clearly printed and displayed, and a credit to all concerned.

In the recent numbers of Ent. Rundschau, Herr H. Beuret has been issuing a number of biological and nomenclatorial "Notes on the Continental Lycaenidae"; and Herr H. Marshener is giving an account of the "Macrolepidoptera of the Riesengebirge"; Dr. A. Seitz continues the account of his journies abroad. In No. 17, Herr H. Reiss and Herr E. G. A. Schneider give an account of the Zygaena-fauna of the Southern Urals illustrated by a plate of 34 figures. New forms are described of Z. meliloti and Z. lonicerae of both of which figures are given.

For some time past an account of the "Lepidoptera of Inner-Anatolia" by Fritz Wagner has been appearing in the Int. Ent. Zeit. Various authors are giving Notes on the Zygaenidae. There is a register of the Noctuidae occurring in Würtemburg and Hohenzollern. Dr. W. Stichel writes on the Genus Notonecta in N. Germany. Herr Schneider discusses the Geometrid Genus Boarmia as laid down by L. B. Prout in Vol. IV of Seitz Palaearctic Geometridae. No less than 16 species are noted as occurring in Würtemburg. Herr G. Warnecke is contributing an article on the myrmecophilous larvae of the butterfly family Lycaenidae, summarising the facts of the connection so far as investigated, with a detail plate. Herr Hugo Reiss is discussing the the races of the beautiful Zygaena fansta of the more southern portions of Europe. There is a very good black and white plate of about 3 dozen figures.

The Ent. Zeit. during the past few months has articles on The Breeding of Acherontia atropos from the egg; a "List of the Lepidoptera of Glatz"; C. Schneider writes concerning the Geometers of Würtemburg; Kurt John introduces a series of new Sphingid hybrids and contributes two plates of figures of Celerio with Mimas, and Sphine. Fortunately none of results of this hybridisation has received names.

The "Lepidopterous Fauna of Corsica" by Dr. C. Schawerda continues to occupy pages in the Zeit. Oesterr. Ent. Ver. Dr. Heydemann with his usual thoroughness, discusses Oporinia christyi. There is a plate with comparative figures of the 3 antennae, the octavals or portions of the hind margin of the 8th segment with tufts, and the last segment of the pupae of C. autumnata, C. nebulata (dilutata) and

C. christyi.

The Report of the London N. Hist. Socy. for the year 1931 contains considerably more entomological matter than it has for some years. For this thanks are due to the energetic Hon. Secretary, Mr. H. J. Burkill, M.A., F.R.G.S., whose contributions are (1) the Report of the Entomological Section, (2) a very interesting paper "An Introduction to the Study of Plant Galls" in which study Mr. Burkill is a specialist, (3) "Plant Gall Records for 1931" with notes on each species observed, (4) "British Butterflies in 1931," a compilation of the observations sent in by some thirty members with the notes summarised. (5) "Heterocera Notes in 1931," a similiar compilation on the Moths. Also there is a few Notes on the Large Wood Wasp (Sirex gigas) by Arthur Richardson, and Studies on the Biology of Fleas by Patrick A. Buxton, M.A., M.R.C.S. (The Bacot Memorial Lecture). We are surprised that the Society had to go to Scotland to get it printed.

Some so-called "gynandromorphs" are circulating; they are

"reported" from three different centres.

REVIEWS AND NOTICES OF BOOKS.

Seitz Macrolepidoptera, Supplement to the Palaearctic Section pts. 34, 35, 36 have been just published. Parts 34 and 36 with 2 plates deal with additions to the Saturniidae and Sphingidae and an Appendix to the latter dealing with the Hybridisation that has been carried out. There is only one British species of Saturniidae dealt with but such well-known species as Graëllsia isabellae, Sannio cynthia, and Saturnia pyri have considerable additional forms named. The hybrids with Saturnia pyri have a section to themselves. Aglaia tan has no less than 15 further recorded forms, while our native S. (Eudia) pavonia has added 16 named forms from localities scattered all over Europe, Additional names are added to the British but none British. Sphingids as follows: to Acherontia atropos 7, to Herse convolvuli 3, to Sphinx liquistri 5, to Sphinx pinastri including those of Dr. Cockayne, 8+4 genitalic forms, to Mimas tiliae 17, Smerinthus ocellata 4, Amorpha populi 5, Haemorrhagia fuciformis 4, Macroglossum stellatarum 1, Celerio euphorbiae 86, C. livornica 2, Pergesa elpenor 4, P. porcellus 2, Hippotion The above summary shows how necessary it is for all British workers to consult the pages of Seitz volumes ere venturing to add further synonyms to our already overburdened Lists. Part 35 is a continuation of Dr. Corti's summary of the Agrotidae, 8 pages and 2 plates. The British species dealt with are Agrotis upsilon (suffusa) with 2 additions, A. segetis (segetum) 9, A. corticea 7, A. vestigialis 8, and A. cinerea 6. The two plates are quite good. With regard to the Agrotid larvae Dr. Corti makes some interesting remarks. He says, "The larvae are as a rule typical subterranean larvae, like those of the genus Euxoa and outwardly very similar to same. However various species already show a tendency to leave the earth and exist above the surface." "The eggs are almost without ridges, occasionally weakly ridged. Generally they are laid loose or in clusters in or on the earth. — Hy.J.Т.

The Report of the Eton College Natural History Society for 1931-2 lies before us. It is a very interesting little report of this very active School Society. Several times throughout each month there is some meeting or other, either Lecture or Excursion, devoted to one of the subjects embraced in the comprehensive term "natural history." Several of the excursions were largely devoted to the search for Lepidoptera. Among the Lectures we note "Life among the Ants," by Mr. W. L. Tutton, "Colour in Animals" by C. R. White-Thompson. Brigadier General B. H. Cooke is thanked for his valuable help in the excellent Collection of European Butterflies and Moths in process of There is a useful article by N. G. Wykes on "Moth Traps" describing the making and use and the results after a three weeks trial. In the last report was a list of Coleoptera taken during The present report gives an additional list of some 82 species collected near Eton. There are 5 admirable plates. A record of another successful year adequately reported.—Hy.J.T.

We regret to learn of the death of the Abbé Joannis, one of the best micro-lepidopterists of France with a fine all-round knowledge of our science.

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EXCHANGES.

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Duplicates .- S. Andrenaeformis, Bred 1928, well set on black pins, with data.

Desiderata.—Very numerous British Macro Lepidoptera.—J. W. Woolhouse, Hill House, Frances Street, Chesham, Bucks.

Desiderata. - Species of Dolerine and Nematine sawflies not in my collection; list sent .- R. C. L. Perkins, 4, Thurlestone Road, Newton Abbot.

Duplicates .- Albimacula*, sparganii*.

Desiderata. - Ova of D.oo. pupae of X. gilvago, D. caesia. A. J. Wightman, "Aurago," Bromfields, Pulborough, Sussex.

EXCHANGES.-Living Eggs of Catocala fraxini and sponsa, exchange for butterflies of British Isles .- C. Zucher' Erfurt, Weimar, Street 13, Germany.

Duplicates.—Pyralina*, Salicis, Ianthina*, Orbicularia*, Repandata in variety, Doubledayaria, Black rhomboldaria*, Black virgularia* and others.

Desiderata.-Hyale, Welsh aurinia, Polychloros, Tiphon Agathina, Lunigera, Lucernea, Neglecta, Diffinis, Populeti, Gothica v. gothicina, White Leporina, Tridens Putrescens. Littoralis, Typhae v. fiaterna, Rurea v. Combusta, Gilvago, Fulvago v. flavescens, Liturata v. nigrofulvata. Harold B. Williams, Woodcote, 36, Manorgate Road, Kingston Surrey.

Duplicates. - A large number of species of European and Palaearctic Rhopalocera

and Heterocera.

Desiderata.—All British species especially those illustrating characteristics of an island fauna. Dr. Lor. Kolb, München 54, Dachauer-str. 409, Germany, and Franz Daniel, München, Bayer-str. 77, Germany,

URGENT.-Wanted English (Cumberland) Erebia epiphron. Adequate exchange will be made in European Lepidoptera. B. C. S. Warren, 14, Avenue de l'Eglise Anglaise, Lausanne, Switzerland.

I am seeking an opportunity of exchanging Macro- and Micro-Lepidoptera with English collectors and beg to send list of duplicates. - J. Soffner, Trautenau (Bezirksbehörde), Bohemia, Tschechoslowakische Republik.

MEETINGS OF SOCIETIES.

Entomological Society of London.-41, Queen's Gate, South Kensington, S.W. 7.

8 p.m. November 16th, December 7th,

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. November 24th, December 8th.—Hon. Secretary, S. N. A. Jacobs, "Ditchling," Hayes Lane, Bromley, Kent.

The London Natural History Society.—Meetings first four Tuesdays in the month at 6.30 p.m. at the London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, W.C.1. Visitors admitted by ticket which may be obtained through Members, or from the Hon. Sec. A. B. Hornblower, 91, Queen's Road, Buckhurst Hill, Essex.

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Melanism and Melanochroism—Bibliography—Notes on Collecting—Articles on Variation (many)—How to breed Agrotis lunigera, Sesia sphegiformis, Taeniocampa opima—Collecting on the Norfolk Broads—Wing development—Hybridising Amphidasys prodromaria and A. betularia—Melanism and Temperature—Differentiation of Dianthæcias—Disuse of wings—Fauna of Dulwich, Sidmouth, S. London—Generic nomenclature and the Acronyctidae—A fortnight at Rannoch—Heredity in Lepidoptera—Notes on Genus Zygæna (Anthrocera)—Hybrids—Hymenoptera—Lifehistory of Gonophora derasa, etc., etc., 312 pp.

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CONTENTS

Notes on Erebiid	Species	s, B. C.	. S. W	arren, .	F.E.S.		••	• •	• •	165
Immigration Rep	ort, La	ncashi	re and	Cheshi	re, H.	W. 1	Wilson	• •		167
An Account of my	7 Studi	es in th	e Biolo	ogy of	Pieris	rapae	o, O. Quer	'c i		168
Scientific Notes verbasci larva				O. lig				Food	of C.	176
Notes on Collect	TING	-Recen	t Addit	ions to	the I	rish 1	Fauna (L	epidop ••	tera),	177
CURRENT NOTES	• •			••			٠٠.	••	• •	177
Corrections			••		• •	• •	••	• •		177
INDEX	• •	• •	• •					• •		178
SUPPLEMENTBr	itish N	octuae.	H.J.	Turner	r, F.E	.S., I	r.R.H.S.		(253)-(256)

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THE VASCULUM

A quarterly journal of Natural History, etc., chiefly for the Northern Counties

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Notes on Erebiid Species.

By. B. C. S. WARREN, F.E.S.

(1) E. pronoë.—I have recently received specimens of a remarkable little race of this species, from the mountains near Krunn, on the south-side of the Isar Tal, in the Bavarian Highlands. This new race at once reminds one of the beautiful little race yardeina, Schaw., but the latter is characterised by the reduction of all markings on the upperside, while the new race is very strongly marked. It may be described as:—

Race varia, nov.—The smallest form of the species, 3 averages 46-48, 9 42-46mm. Other average sizes are; pronoë 50-52mm. both sexes; races, tarcenta, Frhst. 48-50mm. both sexes, yardeina 3 46-50mm. 9 44-48mm.

On the upperside varia is suggestive of tarcenta, for all the black spots excepting the apical two on the forewings, are much reduced in size, and any, or all of them may be lost. The two apical ones remain as large as in typical pronoë. Varia differs from tarcenta in that, in spite of its small size, the bands are as fully developed as in typical pronoë, and the coloured spots on the hindwings often even more developed. In tarcenta the bands are narrow on the forewings, and reduced to mere dots on the hind. In the 2 tarcenta they are extremely reduced on the forewings and entirely wanting on the hind. In the varia 2 they are broader on the forewings than in 2 pronoë and equally so on the hind. This, of course, makes the reduction of the spots all the more conspicuous. There is much variation in the width of the bands on the forewings, which can sometimes be as narrow as in tarcenta, but such specimens still differ from the latter by their smaller size and the invariably greater size of the reddish spots on the hindwings. The variation in the number of the black spots, other than the two apical ones, is endless; but even when all are present they are never fully developed as in pronoe. The underside is typical of the species.

(2) E. neoridas, Boisd.—There have been many uncertain references as to the locality of typical neoridas. In the Index Meth., 1829, Boisduval merely gives "Alpes" as the locality, which naturally has been interpreted in various different meanings. Fortunately in the Icones in 1832 he is more explicit and writes: "Cette espèce a été découverte par nous aux environs de Grenoble. Elle a été retrouvée depuis dans le départment des Basses Alpes... et de la Drôme." The typical race is therefore that of the mountains of the Isère. A decidedly

different race occurs in Lozère, which I would describe as:-

Ssp lozerica, nov.—A much smaller race, averaging 40-43mm. in both sexes; typical neoridas averages 44-52mm. The colour of the bands on the upperside of the forewings is golden rather than a dark reddish, the spots on the hindwings of the same colour but very small; the black spots are reduced in size on both wings and the white pupils frequently wanting on the hindwings. Sometimes the black spots are also lost, and specimens with quite black hindwings, all markings lost, also occur. In the feature of the hindwing markings, lozerica resembles the little race of the Sibillini mountains—sibyllina, Vty.—but in this the spots are still smaller and the colour of the

bands darker; the colour of the lozerica 3 being very like that of the sibyllina \circ . The underside of the hindwings in lozerica is a pale brown, the antemarginal band only very faintly silvered, and the basal area practically unmarked, and merged with the median area. This underside is very different from sibyllina where the bands contrast strongly, but it is extremely like the underside in E. zapateri, in fact both in colouring and marking lozerica might well be taken for a race of the latter. Types from the Causse above Mende, Lozère.

(3) Some races of E. ottomana.—One of the most interesting discoveries in connection with the Erebias was made last year by Herr Dannehl, who found a race of ottomana on Monte Baldo above lake Garda; which he is describing. This race is closest to the ssp. balcanica, Rbl., but differs in being much darker on the upperside, the rusty patches around the apical spots on the forewings being reduced to mere rings, and the spots on the hindwings to mere points, in some cases hardly visible. On the underside of the hindwings, especially in the 3, the Garda race is strongly banded and therefore strikingly different from the more even colour of balcanica. antemarginal band in the ? is also a little better marked than in the 2 balcanica. In his description of the latter, Rebel included specimens from all the known Balkan localities, north of Greece. But balcanica varies a good deal, and the form from the Durmitor in north Montenegro, forms a remarkable transition to the Garda race. race I would describe as:

Race durmitorensis, nov.--A transition between balcanica and Garda specimens, nearest the former, being similar to it on the All the markings on the upperside are considerably reduced, the black spots being affected as well as the bands, the two apical on the forewings being a little smaller than in balcanica and all the others reduced to mere points, or completely lost. In the loss of markings durmitorensis resembles Garda specimens, though as a rule the spots on the hindwings in the latter are still smaller. I have one specimen, however, which is indistinguishable from Garda ones on the upperside, but this is not normal, and the underside remains closer to balcanica. From these notes it might seem that durmitorensis was scarcely worthy of a name, but if attention was not drawn to this race it would be a certain source of trouble, for Durmitor specimens if taken as typical of balcanica would mislead anyone into concluding that the Garda race was the same as balcanica, or that it occurred in Montenegro, either of which would greatly confuse the records of the future

(4) Nomenclature.—I take this opportunity to make three changes

which unfortunately are necessary:

(a) E. erinna, Stg.—This name has already been changed once, by Staudinger himself, but as it is a secondary homonym of Pap. erina, Fab. 1787, it must be changed a second time. I propose the name E. erinnyn, nov. pro erinna, Stg.

(b) E. tyndarus var. retyezatica, Diósz.—This name is a primary homonym of manto var. retyezatica, Diósz. which has page priority over the former. For this Transylvanian form of tyndarus I propose

the name, transylvaniensis, nov.

(c) E. evias orientalis, Rbl. (1914).—A primary homomonym of E. epiphron orientalis, Elw. (Trans. Ent. Soc. Lond. 1900). I propose the

name rebeli pro orientalis, Rbl.

It may be noted that in the case of (a) erinna, Stg., was never a valid name under any rules, only a synonym. If it were not for the rules on homonyms, it would fall under the law of priority. The older name, erynnis, is also a secondary homonym, which was why Staudinger changed it, noting that it was not wise to retain two similar names in the genus. He overlooked the erina of Fabricius or he would certainly have chosen another name. Whatever changes entomologists may make, it is to be hoped they do not alter the rules on homonyms, which are nearly "fool proof" in use, and of great value in dealing with the earliest names. But for them such familiar names as E. aethiops and E. euryale would be lost under the law of priority.

[These 3 examples of the homonymic stupidity of the "Zoological" Rules well emphasise the necessity for the Entomologists to make their own Rules which would apply as such to quite 95% of the world's organisms. As this is being done (notoriously slowly) it does not seem wise to add further to the already overloaded nomenclature. (a) erinna is not strictly a homonym of erina. (b) There seems no practical reason why the name retyezatica, Diósz. should not be applied to every Erebia species if necessary, even if it were a subspecies and (c) orientalis can be applied to every species if necessary.—Hy.J.T.]

Extracts from a letter dated November 7th, 1932 from H. W. Wilson, Hon. Sec., Lancashire and Cheshire Entomological Society.

Only three *Plusia gamma* and *Pyrameis atalanta* have been recorded for Lancashire and Cheshire this year.

Pyrameis cardui in the larval stage is usually observed on the coast sandhills in July, but I am not aware that the species has been seen there in 1932. It had been noted in three of the four preceding years including 1931. Since writing this I have learnt that a single image was observed early in May at Freshfield, Lancs.

It would be interesting to know what evidence there is of the migration of *Plusia moneta*. The increase in the range of this species has been steady and its northward progress has been noted step by step. In these circumstance there does not seem to be any adequate reason for discarding the theory of its introduction with imported delphiniums, unless of course it has been observed well out to sea.

Pyrameis atalanta is apparently classified with P. cardui as a migrant, but its status as a migratory species seems to call for careful consideration. It is curious that although this insect is a very more abundant and more generally distributed species in this country than P. cardui the evidence of migration is not nearly so conclusive. I have not seen any reference to a migrating swarm consisting solely of P. atalanta, but mere notes of its presence, in much smaller numbers, accompanying migrating hordes of P. cardui.*

^{*} See Ent. Record, Vol. XI, p. 279, 1899, P. atalanta seen in numbers 500 miles from the Lizard bound for S. America and Ent. Mo. Mag. No. 809, October 1931, p. 229, which gives an instance contradictory to this view.—T.D.

subject further.

All the Vanessids, including *Polygonia c album* (not regarded as a migrant) have a disposition to wander about, and as *P. atalanta* is so strong on the wing its general distribution seems to be sufficiently explained, in the absence of direct evidence of true migration, by its notorious vagrant habits. It certainly seems to be impartial as to the direction of its long distance flights and may be observed on occasion flying fast on an undeviating southerly course. The value as immigrant records of observations of *P. atalanta* in this country is also so dependent on the question of whether the species is capable of surviving the winter here that it is important that the evidence in favour of its being a local resident should be carefully examined. I have noted below a few significant facts which have come under my notice.

(1) Kept in captivity by myself throughout winter and remained

vigorous in spring—also by H. W. Head (Entom. Nov. 32).

(2) Seen ovipositing in April (Penmaenmawr, N. Wales).
(3) Found drying wings beside empty pupa case in early July

(Penmaenmawr) not same year as (2).

(4) Regularly seen in fresh condition in July in many places in

N. Wales.

(5) Observers frequently remark on excellent condition of specimens seen in June-July, when P. cardui is invariably very worn. The possibility cannot be ignored that such specimens may be bred from ova deposited in April by hibernated butterflies. It will be appreciated that the North Wales observations so early in the year carry greater weight than similar records from the south coast and indicate that local conditions are favourable for the species to maintain itself there from year to year. I would suggest that it is desirable to explore the

(Letter from H. W. Wilson to Capt. T. Dannreuther, 7.xi.32.)

An Account of my Studies in the Biology of Pieris rapae.

By ORAZIO QUERCI.

This year I have made some experiments to get data about the lifehistory of *l'ieris rapae*, Linné, and some other polygenetic species of butterflies. I found an excellent collecting place on the Parkway, near the Art Museum, which by solicitation of the Academy of Natural

Sciences of Philadelphia was left to grow wild.

Last year, at Philadelphia, the outterflies began to emerge in April, but in 1932 the weather was bad in early spring and we saw the first Lepidoptera on the wing on May 15th. I rom that day until now we have collected without interruption taking about 7000 specimens which were brought home still living; some were set in cages, with their host plants, where they laid eggs; others were mounted. Eggs, larvae, chrysalids and imagines were also tried in different temperatures in refrigerators and incubators kindly put to my use by several institutions.

I. Breeding from the Eggs.

(A). The butterflies taken in the field were set in a cage with wild flowers and food plants. Some females laid eggs, and those laid on the same day were reared all together. The lots of eggs

obtained in different days were kept separated. Both in spring and summer the mean temperatures varied from 65° to 75°F, and almost always the eggs hatched in four or five days. In each lot there were a few larvae which grew very rapidly and became full grown in seven days; for others, although being laid by the same female on the same day, full development required 8 to 14 days. The butterflies emerged from the chrysalids in from one to two weeks. From May 19th to September 15th we reared more than 100 lots of eggs, and the whole life-cycle was never shorter than 18 days, and longer than four weeks.

(B). In this fall the temperature was lower; the eggs hatched in 5 to 7 days, the most rapid larvae grew in 10 days, and the imagines emerged after 8 days. The minimum required in development of the imago from the egg is now 23 days instead of 18. I do not yet know the maximum because the other chrysalids of the same lot have not

yet emerged.

(C). On May 19th and 20th we obtained two big lots of eggs from specimens of the first brood taken in the field. Those eggs hatched in 5 days, and one of the larvae, from the eggs laid on May 19th, hatched on the 23rd, pupated on May 30th, and a female emerged on June 7th. That female was not well developed and died without laying eggs. On June 8th one male and one female emerged at home from eggs laid on May 20th; they mated on the same day of their birth and the female laid eggs from June 9th to the 13th, which hatched from the 13th to the 17th of the same month. A few larvae, from the lot of eggs laid on June 9th, pupated on the 20th, and the imagines emerged from them on June 27th.

The male and female of the second brood, emerged on June 8th (mounted after their death), are large, with pale and reduced pattern at the tips of the wings; their descendants, born on June 27th and following days are smaller, with a very black and extensive pattern. All the rapae which emerged in our cage on June 27th from the home born specimens of the second brood, were placed in another cage, where the females laid many eggs for six days. I wished to mount those specimens of the pure-line third brood, but they were so badly broken, while flying in the cage, that I preferred to set in my collection one male and one female, which emerged on June 29th, from the same lot of eggs, which looked very like those emerged two days before and from which I had six lots of eggs from June 27th to July 2nd.

At the beginning of July it was hot: the thermometer reached up to 93° F., and all the larvae of five lots died. Placing the larvae in an ice box and in front of a fan, a few of them, from the eggs laid on June 29th, were able to survive, and pupated. Two females emerged on July 19th, another female and two males on the 21st. These five specimens of the pure-line fourth brood are very small with pale and reduced pattern. The three females laid many eggs, but, in spite of every care, only three larvae survived the heat and pupated. One male and one female of the pure-line fifth brood, emerged on August 9th, mated and the 2 laid 19 eggs only. Another female emerged on the 13th, but did not lay eggs as the male of the same lot was dead.

The pure line rapae of the fifth brood are larger than their parents

and with a very black pattern; they resemble their grand-parents of the third brood.

The 19 eggs, from which I expected specimens of the sixth brood, hatched in four days, the larvae became very big, but all died on August 22nd, on a sultry day when the thermometer reached up to 88° F. Thus my series of pure line breedings remained uncompleted before reaching the sixth brood, but my experiment proves that if I have obtained five consecutive broods from May 20th to August 9th, at least three other broods may occur before the frost in October.

II. TEMPERATURE EXPERIMENTS.

(D). Eggs, larvae and chrysalids tried for 5 to 20 days at 0° F., and later gradually warmed at 30°, 50° and 70° F, died when they

returned to normal temperature.

(E). The spring eggs, larvae and chrysalids died when tried for 25 days at 30° F. The experiment was made again with summer specimens, which remained one month at 30°, and later were gradually returned to the temperature of our rooms. About a half of the eggs hatched, the larvae survived and the chrysalids emerged. Another big lot of eggs was tried for 45 days at 30° F. Very few larvae hatched when they returned to normal temperature.

(F). At the temperature of 45° to 50° F, most eggs of a big lot hatched there after 14 days. The larvae were left in that rather cold room with fresh plants. They grew very little and in about one

month died.

(G). Some chrysalids, placed in a room at 50° F, emerged there after 27 days, but the Lepidoptera were not able to spread their wings.

(H). Many butterflies of different species remained at 60° F for 18 days. All the males died; most females survived and laid eggs when they were placed in our cages.

(I). A lot of eggs placed at 98° F, hatched there in 4 days. All the larvae died almost at once, also if they were taken out from the

incubator they died.

(J). Most larvae in our breeding cages turned yellow and later died

when the temperature reached 85° F for a few hours.

(K). It seems that also in the field, many larvae die when it is hotter than 90° F. As the heat does not injure the chrysalids, the butterflies continue to be plentiful, for about one week, after a wave of heat, later they become scarce for about ten days because the high temperature kills both the small and big larvae. Comparing the results of our collecting with the data of the Weather Bureau of Philadelphia, I am finding a perfect concordance.

The scarcity and often the total absence of polygenetic species which sometimes I observed for ten and more days while collecting in Southern Europe, and which I supposed to be intervals between one

brood and its following, are but the effect of the waves of heat.

III. LIFE-HISTORY OF PIERIS RAPAE AT PHILADELPHIA, IN THE YEAR 1932.

The American authors relate that *rapae* begins to emerge sometimes by the end of March, and often in April. This year the weather was fine in winter but it became bad in early spring, until mid May. On the 15th of this month we took some butterflies.

They continued to emerge until May 20th, and later, until the 26th, only worn specimens were on the wing. The duration of the flying period of the first brood was 12 days. The lack of Lepidoptera in the last days of May was not due to the climate as the weather was fine.

In the afternoon of June 2nd we saw a few rapae in the City, and the following morning we collected two males and one female. The second brood had begun to emerge 19 days later than the first emerged specimens of the first brood. This period corresponds with the result

of our breedings.

To know when the second brood might cease to emerge I had the support of the data of our breedings: minimum of duration of the larval stages 18 days, maximum 28 days, but I was not sure that, both in the cages and in the field, the period would have been the same. A useful indication I might perhaps get by looking at the forms. While most rapae of the first brood are small and with a pale apical pattern of reduced extent, many specimens of the second brood are very large, the grey pattern is a little wider and the ocelli are bigger: Fresh rapae of this exuberant form were taken until June 22nd, that is 28 days later than May 26th, when we saw the last female of the first brood laying eggs. Worn rapae of its largest form were found until June 28th. The flying period of the second brood was 27 days and it was 15 days longer than that (12 days) of the first brood.

In accordance with what I believe to be a rule (when the temperature does not change) the earliest rapae of the third brood should begin to emerge on June 19th, but on that day it was raining. The following day there was 63 per cent of sunshine, and we took some rapae a little smaller than those of the prevailing form of the second brood but with a wide and very black pattern. Specimens of this form became more frequent later. From June 20th to 28th we saw specimens both of the second and third brood flying together and when, on June 29th, the second brood ended, the black-spotted rapae of the third brood remained on the wing alone until July 7th, when the striking form of the fourth brood began to emerge.

I expected that the rapae of the third brood would have disappeared from the field by the end of July, instead the specimens with a prominent black pattern continued to emerge in August, September and until now. For some time I was unable to understand why the duration of the third brood might have been so long, while at home rapae continued to emerge in no more than 28 days since its egg was laid. Only later I knew that the deep black-spotted rapae is also the prevailing form of the fifth brood. This is confirmed by the three pure-line rapae of the fifth brood, which emerged in our cages and

which are black (not grey) at the tips of their wings.

With the support of these data I suppose that the third brood, began on June 19th or 20th, and ended on July 24th. Some females continued to fly until the 30th, or so. By the end of July the butterflies in our cages had lived long and laid many eggs. The probable flying period of the third brood was 44 days, about 17 days longer than in the second brood.

The fourth brood of rapae, which is rare in the hot and barren

countries of Southern Europe and of which we found no specimen in North Africa, has been plentiful at Philadelphia this year. We have taken at least 600 specimens of that pretty form. Last summer the country was always verdant: almost as luxuriant as we have seen in the Tropics in the raining season. At the Weather Bureau I have been told that such a fine summer has not happened in this City for 30 years.

Many specimens of the fourth brood, we collected in the field, are as small and with as pale a pattern as the five pure-line rapae which emerged in our cage from the cross of a male of the third brood with a female of the same generation. This seems to prove that the small size of some polygenetic species is produced by heredity and not by environment. Until now I had believed that the butterflies smaller than usual might be the ones which had grown in distress, but I must change my opinion. The largest number of small Pieris rapae, Pontia protodice, Colias philodice and C. eurytheme were taken, this year, after the field had been for a long time (during their larval stages) the most luxuriant I have seen in the Temperate Zone. From my breedings I have learned that when the larvae of the Pieridae are in distress they die.

The nice rapae of the fourth brood began to emerge on July 7th; fresh specimens were found until August 28th, and some worn females until September 3rd. The flying period of this brood has been 59

days.

Many individuals of the fourth brood (form phaiosoma, Verity) in my collection look to be from the cross of both third brood male and female, as this last brood remained to fly alone for some time last June. In August we found some very small rapae with a black (not pale grey) pattern, which are perhaps the mongrels between the third and fourth broods, which flew together in July.

For the fifth brood I am unable to check whether it began on July 25th and ended on October 7th, according to my forecast, or not. When it began, there still were on the wing specimens of the similar third brood, and in September it mixed with the eighth brood, the form of which is, I believe, the same as in the third and fifth broods. Almost every day, from June 20th until now, we have taken some rapae with a very black pattern; this is the most frequent form of the species, being of the third, fifth and eighth broods. Also among the so-called second brood there are specimens which resemble those of the third, etc. This occurs for a cause which I will try to explain later.

The large rapae of the second brood did not fly after June 28th; after that day we found only smaller (third and fifth brood) and much smaller (fourth brood) specimens on the wing; also their mongrels were not large. On August 12th a few white rapae, which looked like those of the second brood, were found. The appearance of this showy form, which we had not seen for 45 days, happened just when I had foreseen that the sixth brood should begin to emerge, and this allows me to suppose it may be the peculiar form of rapae when two purebred specimens of the fifth brood cross together or when the third brood crosses with the fifth. Some large rapae have been taken almost every day from August 12th until now, but they have not been plentiful, because the fifth brood, having flown together with the

fourth, which is small, produced mongrels of reduced size. I was not able to get in my cages any specimen of the sixth brood, as the 19 larvae, I had from the pure-line rapae of the fifth, died after the wave of heat of August 22nd, but from that breeding I learned that the pure sixth brood rapae must be large, as the larvae which grew more rapidly and that were trying to pupate when the heat killed them, were very big.

The pure bred rapae of the seventh brood, which began to emerge on August 29th, have been scarce, as their pure bred parents had not been plentiful and had mated with those of the fourth and fifth broods and their mongrels. I have no positive data to establish which may be the peculiar form of the seventh generation; I suppose that some small rapae, like those of the fourth, but dusted with black scales (owing to the increasing humidity in the fall) may be those of the seventh when one pure-bred male of the sixth crossed with a pure-bred female of the same brood. This year these dwarf rapae, the smallest in my series, emerged from chrysalids made by larvae which, in August, had lived among the most luxuriant vegetation. Also in this case, the very reduced size seems not to be produced by environment but by heredity. I think these specimens, flying in September and also in these last days (October 1st to 10th) can not be still those of the fourth brood which should be ended by the beginning of last September.

On August 31st, after the eclipse, a wave of heat (up to 95°F) arrived in this country and continued for some days. In spite of that the Lepidicum virginicum, which is the plant that the larvae of rapae prefer to eat, remained verdant everywhere, and the period, 18 to 28 days, for the metamorphosis, remained unvaried for the specimens which we bred in September. I suppose that the eighth generation began to emerge on September 18th, but I cannot prove my assertion. I also suppose that the pure bred rapae of the eighth brood may be as black spotted as those of the third and fifth broods.

What I observe is that, in spite of the considerable hybridisation, rapae has never been so variable as in September: dwarf specimens of the seventh flew together with the giants of the sixth and the black-spotted individuals of the fifth. If some rapae of this last form are

those of the eighth brood, is not sure but likely.

By the middle of September until now the weather has been unsettled and the field is not so verdant as in summer. The butterflies in the cages die quickly, laying very few eggs. The wave of heat at the beginning of September has lowered the number of butterflies on the wing. However the larvae, which we are rearing, continue to grow almost in the same time as in spring and summer. Perhaps the emergence of the chrysalids will be delayed, but if the weather continues fair for a few days longer, a ninth brood may occur this year although last spring the lepidoptera began to appear very late in the season.

What I have tried to explain above can be shown by the following table where (1) for every brood, I record (2) the day on which the specimens of each brood probably began to emerge; (3) the not so probable

days on which the last specimens of every brood emerged; (4) the day on which they ceased to fly and to lay eggs; and (5) the presumed duration, in days, of each brood:

(1)	I	II	III	IV	V	VI	VII	VIII	IX
(2)	May 15.	Jun. 2.	Jun. 19.	Jul. 7.	Jul. 25.	Aug. 12.	Aug. 29.	Sep. 18.	Oct.?
(3)	May 20.	Jun. 22.	Jul. 24.	Aug. 28.	Oct. 1.	(a)	(a)	(a)	(a)
(4)	May 26.	Jun. 28.	Jul. 30.	Sep. 3.	Oct. ?	(a)	(a)	(a)	(a)
(5)	12	27	44	59	75?	(b)	(b)	(b)	(b)

- (a) A few chrysalids of the VI, some of the VII, many of the VIII and most of the IX brood will go over winter, emerging in the spring of 1933.
- (b) It is not possible to state the duration of the flying period of the last broods, which will occur after the winter pause.

In accordance with the data of the preceding table, the broods of *Pieris rapae* have probably emerged and overlapped (at Philadelphia and in the very regular season of 1932) as follow:

from May 15 to May 26, first brood;

from May 27 to June 1, interval between the first and second brood;

from June 2 to June 18, second brood alone;

from Jun. 19 to Jun. 28, second and third;

from Jun. 29 to Jul. 6, third alone;

from Jul. 7 to Jul. 24, third and fourth;

from Jul. 25 to Jul. 30, third, fourth and fifth.

from Jul. 31 to Aug. 11, fourth and fifth;

from Aug. 12 to Aug. 28, fourth, fifth and sixth;

from Aug. 29 to Sept. 3, fourth, fifth, sixth and seventh;

from Sep. 4 to Sep. 17, fifth, sixth, and seventh;

from Sep. 18 to Oct. ?, fifth, sixth, seventh and eighth;

from Oct. ? to Oct. ?, sixth, seventh, eighth and ninth.

Now I hope to be able to get the data which are still missing; later I will check better, with the support of my collection of more than 2000 rapae, 300 protodice, 200 philodice and eurytheme, which seem to emerge in the same manner as rapae, all mounted and labelled.

I regret not to have been able to breed all the larvae from the eggs laid by one single female of *Pieridae*, to see whether all the imagines are equal among them, or not. I succeeded with the larvae of *Papilio* and *Phyciodes*, when I obtained imagines 98 per 100 of the laid eggs, but the larvae of *Pieridae* are very frail, and from more than 12,000 larvae, which I tried to rear, I had no more than 250 chrysalids.

Also in the field the mortality must be considerable when it is very hot, and still more when it is hot and dry. Some authors say that one female of rapae can lay more than 200 eggs; also supposing that the eggs are only 25 of which 15 males and 10 females, if each egg might produce the imago there would be 10 females at the second brood, 100 at the third, 1,000 at the fourth, 10,000 at the fifth, 100,000 at the sixth, 1,000,000 at the seventh, 10,000,000 at the eighth. This does not happen; the butterflies instead of being plentiful are scarce chiefly because the heat killed most larvae.

IV. OBSERVATIONS.

I feel almost sure that the data I record for the beginning of the first to the seventh brood are right. At any rate the error can be no more than one day or two. From May 15th to September 10th the temperature lowered to 50°F only thrice (May 19th and 23rd, and June 8th) during the night. The minimum mean temperature varied from 61.3° in May to 69.4° in August, and in those conditions, the larval stages went ahead with the greatest regularity.

The data which I quote for the end of every brood are tentative, because in each lot of larvae, which we have bred, those which grew slowly always died. The search in the field for the last living female of every brood is not an easy task, not only because it is hard to find her, but also because I based my investigation looking at the form.

That the form of rapae should change from a generation to its following is a simple opinion which I base on the fact that the specimens of the second, third, fourth and fifth brood, which I obtained from consecutive breeding, changed at each brood, and that their change corresponding with it had occurred in the field some days before. However I must notice that my series of pure-line rapae is very poor. I had many chrysalids of the second brood, most were tried in temperature experiments and in many cases died; also of the third brood I had many pupae, some died when tried at low temperature, others emerged but the specimens were ruined in the cages; of the fourth brood I obtained five specimens, of the fifth only three. This is all.

The study of the variation, referred to the identification of the broods, is also doubtful because also the specimens of the first generations are not alike among themselves in my series of rapae, the earliest emerged almost at the same time from May 15th to 20th, there are a few, which look different from the others and seem to have not been produced by chrysalids, which had gone over winter. Among the rapae of the second brood, emerged in the first fortnight of June, when certainly the real third brood specimens had not had time to emerge, I see some specimens, with very black spots, which look like those of the true third brood, which surely did not began to emerge before June 19th.

The presence of these specimens which apparently have advanced one brood over their time of emergence, allow me to suppose that either the eggs, or the larvae, or both, might go over winter together with

the chrysalids.

From my experiment (E), related at p. 170, I have learned that very few eggs, of a big lot, survived when kept 45 days at 28° to 30°F. At Philadelphia, this year it was never cold in winter for long. The coldest days were: Dec. 8th, 1931, Jan. 23rd, Feb. 1st and 16th, March 9th, 1932, on which the thermometer was 28°F for a short time. Perhaps some eggs, laid in the last fair days of October, 1931 and remained unhatched, were able to survive, and hatched during the first days of April, when it was 67° and 78°F. The larvae did not die, as is shown in my experiment (F) at p. 170, and pupated about on April 28rd, when the max temperature was 72 to 79°F., but were not able to emerge until middle May, when it was 77° to 87°F.

presence of these specimens from the egg-cycle are a trouble when they are mixed with those of the chrysalids-cycle in the first brood. Now I am arranging to keep many eggs to see wether they will hatch next spring, or not.

V. Conclusion.

My experiments are still incomplete, but at any rate I can state that:

1. Pieris rapae and many other polygenetic species are ready to be prolific at any time of the year, as soon as the temperature allows their eggs to hatch. In Southern Portugal we collected many polygenetic butterflies in January of 1928.

The cold injures only when it is, probably, below 15°F.

Otherwise it only delays the metamorphosis.

3. The intensive heat, above 90° F produces a terrible massacre of larvae, but does not injure either eggs or chrysalids.

4. When the mean temperature is above 60°F, a new brood occurs about every 18 or 19 days. (I have not yet full data for the fall.)

5. The duration of every brood is at least 15 days longer than that of its preceding brood, and therefore all the broods, save the first,

overlap.

6. This year, at Philadelphia, with a uniform and favourable season, but shorter than in most years, certainly eight broods have emerged, and probably a ninth may occur. When the butterflies emerge here from April to October there may be 10 or 11 broods. In Southern Spain and Portugal, and in the southern portion of the United states, perhaps 14 broods occur in most years.

PHILADELPHIA. October 11th, 1932.

SCIENTIFIC NOTES AND OBSERVATIONS.

Length of Life of the Imago of Orrhodia Ligula.—Of this species South (Moths Brit. Is.) says "It lives through the winter . . . but does not seem to turn up at sallow catkins in the spring," Adkin (Moths of Eastbourne) "It is doubtful whether it ever lives through the winter." In this connection it may be interesting to note that I took a specimen at Chipstead, Surrey, on January 30th of this year, at rest on a hawthorn by night, which was fed with sugar at intervals and lived until mid-April.—J. A. Downes.

"Food" of Cucullia verbasci Larvae.—This year I collected a few larvae of C. verbasci at Box Hill. They were kept in a cardboard honey carton, which as usual had a thin layer of wax on its surface. One day the larvae were given insufficient food, with the result that they nibbled through the wax and started on the cardboard underneath. A friend of mine had a somewhat similar experience with this species. He enclosed them in a muslin sleeve, again with insufficient food, and found next day that they had eaten a hole in it and escaped.—ID.

OTES ON COLLECTING,

RECENT ADDITIONS TO THE IRISH FAUNA AND FLORA. [Proc. Roy. Irish Acd. XXIX (1929.)] -With reference to the comments of Canon G. Foster on the above in the April No. of this journal, page 63, the following are additional records and corrections.

Argyroploce (Diluta) semifasciana, Hb.—Barrett writes, in British Lepidontera (1905), "taken by Canon Cruttwell in Connemara;" not uncommon among sallows, Killycolpy Wood, Co Tyrone, June 1920.

A. (Penthina) corticana, Hb.—Beaten out of birch near Maghery,

Co Tyrone; and Churchill, Co Armagh.

A. (Euchromia) rufana, Scop. -- Near Stewartstown, Co Tyrone,

June 1921.

Eniblema crenana, Hb.—Lisdoonvarna Co. Clare, larva found and imago bred August 1929, W. G. Sheldon: Entom. Vol. LXII page 241.

Chimabache (Diurnea) phryganella, Hb.—Tullylagan Co. Tyrone, October 1921.

Tinea semifulvella, Haw.—Already recorded by Kane from Sligo, Clonbrock, and Bray; near Stewartstown, August 1923.—Thomas GREER, Milton, Dungannon.

CURRENT AND SHORT NOTES NOTICES.

The Hon. Treasurer will be obliged if those subscribers who have not yet paid for the current volume (1932) will do so before the end of the year. The amount (10/-) should be sent to II. W. Andrews, F.E.S., 6, Footscray Road, Eltham, S.E.9.

Several readers have sent or promised to send notes on the season's experiences. We shall be very pleased to have others. General reports seem to tell us that there never was a worse season and yet we hear of captures of unusual species and some of our very young collectors have not done badly.

Corrections.—By an oversight an incompleted proof of the November number was passed "for press" and thus several important corrections are necessary, besides spelling, etc.

- p. 149, l. 13, Pocy = Pocy: l. 23, aesculi = esculi.
- p. 151, l. 7, insert a "," before "different" l. 27, Coll. = Coleoptera.
- p. 152, l. 9, "layendar" = "layender": stoechus = stoechus.
- p. 153, l. 40, "Ramn."="Ramb.": l. 41, del "as": Mediterranean.
- p. 156, l. 14, insert "1932" after "wing.": "Aeschna"= " Aeshna": except.
 - p. 157, l. 34, "vividior"="viridior": l. 48, del stop after "nec."
- p. 161, l. 3, Hydraecia = Hydroecia. p. 162, l. 25, Stenichnus = Stenichus.
 - p. 163, l. 35, the generic initial "C." should be "O.": journeys.
 - p. 164, l. 8, Aqlaia = Aqlia.

CONTENTS OF VOLUME XLIV.

By Hy. J. TURNER, F.E.S.

PAGE	PAGI
Aberrations of R. phlaeas, 15; C.	Description of, Kerry, Ireland, 1;
$quadripunctaria, 16 \; ; \; E. \; jurtina,$	a willow swamp, 4 ; L. of P .
128; E. vestigialis 130	globulariae, 17; L. of P. cognata,
Abundance of Theclids in Kabylia 59	19; New forms of Melitaea, 28,
"Addition to List of Lepidoptera of	29: Fontainebleau, 34: Dieulefit
Ireland," Rev. Canon Foster, 63;	(Drôme), 53; B. hypnorum,
"Recent additions to ditto," T.	(Drôme), 53; B. hypnorum, (Hym.), 55; M. pacifica, 71;
Greer 177	Bromsgrove area 161
Address to Ent. Soc. of the S. of	"Devonshire Coleoptera, Notes on
England 96	some," H. Donisthorpe 150
Aegeriides connected with juniper 54	"Dieulefit (Drôme), in April, 1930-
Affinity of Faunas of N. Scotland	31, Lepidoptera at," Wm.
and Ireland (Lep.) 76	Fassnidge 55
"Aigle and the Rhone Valley in	"Diptera in 1931," H. W. Andrews 122
May, 1931," Lt. E. B. Ashby, 55, 72	"Early stages of P. globulariae and of P. cognata," Dr. E. A.
Assembling 44	and of P. cognata," Dr. E. A.
Biology of, S. spuleri in juniper, 54; M. atropos, 62; Spiders,	Cockayne and C. N. Hawkins,
54; M. atropos, 62; Spiders,	17; appearance of P. atalanta 93
Review, 67; Microlepidoptera,	Entomological Club, 31, 50, 64,
Review, 67; Microlepidoptera, Review, 95; Z. exulans, 99;	131, 142, 162
"Triple-brooded species," O.	"E. polychloros in Essex," E.
Querci, 158; "An Account of	Bentall 12
my Studies on the B. of P.	"Erebiid species, Notes on," B. C.
rapae," O. Querci 168	S. Warren 165
"Birds and S. gigas," T. B. Foster 129	"E. vestigialis in Dorset," Hy.J.T.
"Brachypterous Earwigs. A	(T. P. Curtis) 129
Problem," Dr. M. Burr 98	Exhibition, Lancashire & Cheshire
Breeding of, D. truncata from ovo,	Ent. Socy 15
11; nubeculosa, 44; Pierids from	"Fauna of Albania," Rebel and
the egg 168	Zerny, Review, Hy. J. Turner 52
Broods of C. croceus 7	"Food of C. verbasci larvae," J.
"Buttercups, B. fumatus in," H.	A. Downes 176
Donisthorpe 93	Forms of aurinia in Kerry, 2; P.
"Butterflies, in Kabylia," Miss L.	brassicae 89 Galls, juniper
M. Fison, 12; at flowers,	Galls, juniper 53
41; " of the Pulborough District,"	"Geographical Variation of B.
A. J. Wightman 127	euphrosyne," Dr. R. Verity 119
Cat lying in wait for moths 83	Geometers in Kerry 25
"Catalogue of the Coleoptera of	"Handbook of British Beetles," N.
the Forest of Fontainebleau,"	Joy, Review, M. Burr, 51; H.
Review, H. Donisthorpe 33	Donisthorpe 64
Classification of the Psychidae, 118, 133	Heterocera in Kerry 3
Comparison of Faunae (Col.) of	Hibernation of, P. atalanta 58
Fontainebleau and Windsor	"Holiday at Braemar, A," Dr.
Forests 35	E. A. Cockayne 99
Cocoon of P. cognata 21	How R. linearis (Hem.) swims, H.
"Coleoptera of a Willow Swamp,"	Donisthorpe 129
H. Donisthorpe 4	Hübner's Plates, Dates of 9
Collecting Notes, 10, 61, 76, 93, 127, 142, 160, 177; "Lepidop-	"Illustrations of Varieties of,
toro in 1021 21 H. D. Fottle	British Lepidoptera," S. G.
tera in 1931," H. B. D. Kettlewell 43	Castle-Russell, 10; ditto, C. Mosley, 86; ditto "European Butterflies," C. Mosley, 102, 124, 135 Immigrant, Lepidoptera, etc., 49,
Correction in, British List of Lepid-	Buttardian ? C Mosley 100 194 195
optera 9, 17, 65, 66, 89, 128; Footnote Correction 77, 96	Immigrant Louidentons etc. 40
"Cornish Notes for 1931," C.	199 /P & Smith): 120 156 (Cent
Nicholson 41	128 (P. S. Smith); 130, 156 (Capt.
Nicholson 41 C. pronubana and its Parasites 10	Dannreuther); 162; "Species in Lancashire and Cheshire,"
Current Notes, 13, 31, 47, 64, 78,	H. W. Wilson 167
94, 115, 131, 142, 162, 177	International Congress of Entomo-
Cuttings, A Nature Story, 11; In-	logy, 5th, 49, 78, 115
valuable Words, 14; A Curious	"Invaluable Words" 14
Beetle 49: A literary Curiosity 142	Juniper Insects at Dieulefit 53
Beetle, 49; A literary Curiosity 142 "Dates of Hübner's Plates,"	"Larvae of P. rapae, P. napi and
Hy.J.T 9	P. brassicae on the same plant,"
	C. Nicholson 11

PAGE	PAGE
"Late larvae of D. truncata," C.	Pupa of C. cognata, 21; "What is
Nicholson 10	the meaning of a P. ?," N. H.
"Length of Life of Imago of O.	Joy 87
ligula," J. A. Downes 176	Pupation of Z. exulans 100
" Lepidoptera, at Dieulefit (Drôme)	"Query, A, re E. jurtina," B. J.
in 1930-31, 53, 81; near Broms-	Lempke 128, 142
grove (Ran-dan Woods) '' 1827-	"Races," O. Querci 149
31, P. S. Smith 69, 84	Races, of, M. parthenie, etc., 27;
"Lithosia pallifrons (vitellina) ab.	B. euphrosyne, 110; "E.
pygmaeola," H. B. D. Kettlewell 8	jurtina," P. P. Graves 142
₹ ÎT! /	Rare species, L. bicolor, 3; H.
Medical Entomology, Review 80	laticollis (C.), 5; O. salictaria
Melanic, A. urticae 32	(C.), 5; O. nigrocincta (C.), 5;
"Melitaea pacifica, hitherto con-	M. morosus (C), 5; C. palustre
fused with M. britomartis," Dr.	(C.), 5; C. rufulus (C), 5; P.
	lanornica 16: H neltigera 41:
R. Verity	livornica, 16; H. peltigera, 41; M. atropos, 41, 62; S. bipunctatus
P. gamma in Ireland, 24; N.	(D), 42; S. aurulenta (C.), 42;
noctuella in Ireland 26	E. versicolor, 44; A. nubeculosa,
Misuse of "Lycaeides" for	44; S. spuleri, 54; S.
"Plebeius, etc.," 40	tabaniformis, 55; B. hypnorum
New forms of, Melitaeae, 28, 29,	(Hym.), 55; P. cognata, 62; P. globularia, 62; P. staintoniana,
70, 140; British Species of	
Lepidoptera, 30, 138, 157; B.	63; P. anthacina (Col.), 93;
rhomboidaria, 46; Genus of	R. sacraria, 130; S. dubius (Trich.) 160
Psychides, 97; races of B. euphro-	
syne, 112, 113, 114, 120, 121; of	"Rare Dipteron taken in Windsor
Erebia, 165; E. vestigialis 130	Forest, A," H. Donisthorpe 93
"New form, A, of B. rhomboidaria,"	"Records of Immigrants at
H. B. Williams, 45; M. pacifica 71	Hastings," Capt. T. Dannreuther 156
Noctuidae in Kerry 25	"Reduviidae collected in the Bar-
Nomenclature, 40, 65, 115, 144	berton District, E. Transvaal,"
"Northern Insects in Co. Wicklow,"	J. S. Taylor 154
A. W. Stelfox 76	"Report on Immigrant Species in
"Notes on, Algerian Butterflies,"	Lancashire and Cheshire," H.W.
Miss L. M. Fison, 7, 58; "Lepi-	Wilson 167
doptera of Salonica," Dr. G. S.	Reviews, Short, 13, 14, 31, 32, 33,
Robertson, 61; "the Psychidae,"	37, 47, 48, 49, 51, 52, 64, 65, 66,
Rev. C. R. N. Burrows, 117,	67, 68, 78, 80, 94, 95, 96, 115,
133; "Worcestershire Lepidop-	116, 131, 142, 143, 146, 147, 148,
tera," P. S. Smith, 128; "from	162, 163, 164
Spain," Dr. M. Burr, 152; "A.	Review of, Mr. E. R. Goffe's
atropos in E. Sussex, LtCol. D.	Paper on "Tabanidae," J. E.
G. B. Hawley, 160; "from	Collin, 37; "Stylops," Hy. J.
Stratford-on-Avon," P. S. Smith,	Collin, 37; "Stylops," Hy. J. Turner, 32; "Catalogue of Col-
160; "from Dorset," R. Troup,	eoptera of Fontainebleau,'' Col
161; "Erebiid species," B. C. S.	Guardet, H. Donisthorpe, 33;
Warren 165	"Practical Handbook of British
Obituary, E. Step, 16; G. Crabbe,	Beetles," Dr. N. Joy, M. Burr,
61; J. J. Joicey, 68; R. South,	51; "Biology of Spiders," E. Nielson, Hy. J. Turner, 67;
68; J. C. Robbins 78	Nielson, Hy. J. Turner, 67;
Original Descriptions, The, of the	"Medical Entomology, W. A.
late S. L. Mosley (C. Mosley in	Riley, Hy.J.T., 80; "Biology of
error) 60	the Microlepidoptera," K. T.
"Parasites of C. pronubana," C.	Schutz, Wm. Fassnidge, 95; "Bees, Wasps, Ants and Allied
Nicholson, 10; Parasitic Hymen-	"Bees, Wasps, Ants and Allied
optera with Ants 86	Insects of the British Isles." E.
optera with Ants 86 Pentatomid, A.S. African (U.	Step, Hy.J.T., 131; "Journal
typica)," J. S. Taylor 62	and Trans, of the S. of England
	Ent. Socy., Hy.J.T., 143, 146;
Pests of basket-willow 47 Pins, Entomological 94, 115	"Annotated List of Coleoptera
P. rapae at Philadelphia in 1932 170	of the Isle of Sheppey, J. J. Walker, H. Donisthorpe, 147; "Iberican Rhopalocera," O.
Processionary caterpillars 82	Walker, H. Donisthorpe, 147;
' Psychides, A new genus of," Rev.	"Iberican Rhopalocera," O.
C. R. N. Burrows 97	Querci, Hy.J.T 148

.. to face page 97

133

Rhopalocera in Kerry
Fison
Localities:—Abbots Wood, 15; Aigle, 55, 72; Algeria, 7, 58, 74; Argentine, 65, 79; Barberton, 154; Braemar, 99; Bromsgrove, 69, 84; Columbia, 66; Cornwall, 10, 41; Devonshire, 150; Dieulefit (Drôme) 53, 81; Dorset, 161; Folkestone, 64; Fontainebleau, 33; Hallsands, 151; Hastings, 156; Ireland, 1, 23, 63, 76, 177; Kabylia, 7, 10, 58, 74; Kerry, 1, 23, 43; New Forest, 15; Pulboro, 127; Ran-dan Woods, 69; Rhone Valley, 55, 72; Salonica, 61; Scotland, 43, 76; Slapton, 151; South Seas,
Windsor, 4, 33; Worcestershire,
Ashby, Lt. E. B

I. Male Genitalia of Acentra vestralis

II. Male Genitalia of Psychidae

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8 p.m. January 18th, Annual Meeting.

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Genus Acronycta and its allies.—Variation of Smerinthus tiliae, 3 coloured plates—Differentiation of Melitaea athalia, parthenie, and aurelia—The Doubleday collection—Parthenogenesis—Paper on Taeniocampidae—Phylloxera—Practical Hints (many)—Parallel Variation in Coleoptera—Origin of Argymis paphia var. valesina—Work for the Winter—Temperature and Variation—Synonymic notes—Retrospect of a Lepidopterist for 1890—Lifehistories of Agrotis pyrophila, Epunda lichenea, Heliophobus hispidus—Captures at light—Aberdeenshire notes, etc., etc., 360 pp.

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ascribed to basilinea by its author in his Vol. I. of additions since the issue of Seitz Pal. Noctuae.

Orig. Descrip.—"Has a pale clear brown colour of forewing running slightly into reddish, while in lama it is light (yellowish) grey. The females agree consistently in having the hindwings almost uniformly darker grey brownish; the central line of the hindwing is also clearly developed on the upperside. In the single 3 obtained the colour of the forewing is more reddish than in the females; but the hindwings of the male are darker than in lama, although not so dark by far as those of the females of dubiosa. The eyes are naked as in lama."

Apamea Tr. (1816-25) Tutt, Gn., Barr. [Hadena, Schrnk. (1802) Stdgr., Meyr., Culot: Xylina, Tr. (1816-25): Trachea, Tr. (1816-25) Hamps.: Parastichtis, Hb. (1827) Warr.-Seitz: Hama, Steph. (1829): Luperina, Dup. (1842) pabulatricula, Brahm. (1791) = connexa, Bork. (1792).

Bork., Nat. Eur. Schm., IV. 360, although he referred to the name pabulatricula (mis-spelled papulatricula) of Brahm, Scriba's Beitr. III. 259, plt. XVIII., renamed the species connexa, a name which stood many years for this species.

Even Treit. l.c. V(2). 105 (1825), used the name connexa giving

Brahm's name as a synonym. So did Gn. and Dup.

The spelling papulatricula was used on the plate in Scriba but pabulatricula was used in the text.

Tutt B.N. I. 86 (1891): Barr., Lep. Br. Is. IV. 398, plt. 184 (1897): Stdgr. Cat. IIIed. 175 (1901): Splr. Schm. Eur. I. 196, plt. 41 (1905): South Moths Br. Is., I. 273, plt. 132 (1907): Hamp. Lep. Phal. VII. 172 (1908): Warr.-Seitz Pal. Noct. III. 168, plt. 40d (1911): Culot N. et. G. I(1). 165, plt. 30 (1909-13).

Hb., l.c., 462 (1808-18), figured a form of the species under the name elota, in which there was a wide transverse brown clouded band with the almost black inner-marginal square spot included. Subsequently in his Text Hb. p. 182 (1805-18) altered this to connexa.

Ernst and Engr. l.c. VI., p. 116, fig. 351 (1788), figure two examples without name, the one nearer to the fig. of Brahm but darker clouded,

the other closely resembling the elota of Hb.

Dup. Sup. l.c. plt. 68, 4, is a good figure but somewhat too bluish grey.

Spuler, l.c. 196, treats semibrunnea, Petersen, as the same as elota, Hb.

Culot, l.c. I(1). plt. 30, has an excellent figure.

Of the variation Barrett says-" Hardly variable except in the greater or less completeness of the broad central band, and in the tinge of brown over the grey-white ground colour."

Barrett records a specimen, "of which the ground colour is wholly

dark grey, and the central band tinged with brown."

List of Forms and Names to be considered:—
pabulatricula, Brahm Ins. Kal. II(1). 395 (1791).

connexa, Bork. Naturg. IV. 360 (1792).

ab. elota, Hb. Saml. 462 (1808-18).

ab. semibrunnea, Ptrsn. Beitr. (Lep.) Kunde Est. &c. IV. 84 (1902).

ab. conjunta, Splr. Schm. Eur. I. 196, plt. 41 (1905).

Tutt dealt with elota with ochreous central and basal area and with the typical form pabulatricula = connexa.

ab. semibrunnea, Petersen, Beitr. Lep. Fn. Est. &c. 84 (1902.)

ORIG. DESCRIP.—"There occur examples in which the basal half of the forewings up to the reniform and the outer transverse line is uniformly brown or brown black, so that the forewings have a dark basal half and a pale marginal half." Wesenburg-Reval.

Splr. l.c., 196, says that semibrunnea is the same as elota, Hb.

ab. conjuncta, Splr., Schm. Eur. I., 196 (1905).

ORIG. DESCRIP.—"A form in which the pale basal area (of the type) is united with the outer light marginal area by a broad yellowish white band above the orbicular and reniform along the costa."

Apamea, Tr. (1816-25) Steph., Tutt, Barr. [Hadena, Schrnk. (1802) Meyr.: Parastichtis, Hb. (1822) Warr.-Seitz: Oligia, Hb. (1822) Hamps.: Miana, Steph. (1829) Stdgr., Splr., Culot.] ophiogramma, Esp.

Tutt Brit. Noct. I. 87 (1891): Barr. Lep. Br. Is. IV. 399, plt. 184 (1897): Stdgr. Cat. IIIed. 164 (1901): Splr. Schm. Eur. I. 180, plt. 41 (1906): South Moths Br. I. I. 274, plt. 132 (1907): Hamps. Lep. Phal. VII. 374 (1908): Culot Noct. et G. I(1). 121, plt. 21 (1909-13): Warr.-Seitz Pal. Noct. III. 170, plt. 40f. (1911).

Esper's fig. on plt. 182, Vol. IV., is very wooden and rough, and the darker markings are much too dark in contrast with the light ground which errs in being much too smooth and light; no lunule on h-wing.

Ernst and Engr. l.c., VIII. fig. 529 is more like Esper's fig. and

by no means good.

Hübner, l.c., fig. 355, correct in contour of marking is too much slate in colour and no suggestion of the normal ochreous suffusion, i.e., a badly coloured figure.

Treit. in 1825 said that the fig. 529 of Ernst and Engr. was better

than Hübner's and much better than Esper's.

Dup. l.c. plt. 109 vol. VII. has a good figure but the dark area is too contrasted with the ground and there is very little trace of the yellow ochrous.

Wood's fig. Ind. 272, is a somewhat dark form and not like Hübner's fig. in colour at all. The former has a rich brown tone over all, the

latter a pale grey or slate tone.

Freyer's fig. on plt. 75 is better than those of his predecessors but not very successful. It is between Esper's and Hübner's in general tone of colour.

South, l.c., I., plt. 132 gives a good fig. except that the lighter ground hardly shows the tone of average examples.

Warr.-S., *l.c.*, plt. 40 f. has one of the best figures of the yellowish ochreous typical form.

Culot has an excellent figure, l.c., I(1). plt. 21.

Since Haworth identifies his biloba with Hübner's figure which is not coloured as Esper's fig. and description, the name biloba should take the place of ophiogramma for Hübner's fig. This is supported by Haworth's description "alae anticae griseae," while Esper's figure is yellowish ochreous.

Variation according to Barrett.—" Usually not very variable."

Barrett records specimens, "having the ground colour pale slategrey, dark slate, and smoky slate with intermediates."

He also records a specimen "which has the orbicular stigma and

a blotch near the hind margin rich orange-yellow."

List of Names and Forms to be considered: ophiogramma, Esp. Abbil. IV(3). 10, plt. 182 (1794?). ophiogramma, Hb. Noct. 355 (1802-8). ab. biloba, Haw. Lep. Br. 209 (1806-10). ab. moerens, Stdgr. Cat. 164 (1901). Tutt dealt with the typical form and ab. biloba.

ab. moerens, Stdgr. Cat. IIIed. 164 (1901). Fig.—Snell. Ent. Tijds. plt. XII. 3 (1897).

Oric. Descrip.—" Multo obscurior, al. ant. fere unicolor nigricantibus; ab. frequens."

Ground colour blackish; forewing with the grey area suffused with fuscous. (Hamp. Lep. Ph. VII. 375).

Apamea, Tr. (I816-25) Gn., Tutt, New. [Hadena, Schrnk. (1802) Frr., Culot, Splr., Steph., Stdgr.; Parastichtis, Hb. (1822) Warr.-S.: Trachea, Tr. (1816-25) Hamp.] gemina, Hb. (1808-18) [=remissa, Hb. (1808)].

Hübner, l.c., figs. 482, 483 are labelled gemina, but 483 is obviously not a gemina but thalassina. Hübner in his Text. p. 193 refers to 483 only as gemina. Tutt, B.N., does not refer to fig. 483 but only to 482 which may be considered the type figure of the gemina form. This was published between 1808 and 1818.

Hübner, l.c. fig. 423 is labelled remissa, a good figure of a form with an extremely light ground and dark band. This was published in 1808, and consequently should be considered in the light of subsequent discovery that gemina and remissa are one species, the typical form and

name.

Haworth, Lep. Brit. 189 gave a description of a moth and referred it to Hübner's remissa 423. This was published in 1806-1810 and must have been subsequent to Hübner. On the same page Haworth described a variety of remissa under the name obscura ("varietas praecedentis"). Whereas remissa was a genistae-like insect, obscura was described as "Alae anticae magis obscurae, seu fusco-cinereae, macula magna basi costali pallidiore, lineolae atrae internè adnatâ. Juxta marginem posticum striga obsoletissima undulata vix pallescens.

Posticae cinereo-fuscescentes," and thus described and preceded the figure of qemina, Hübner 482.

The actual Synonymy for the two chief forms would thus appear

to be according to priority.

remissa, Hub., 423 (Haw.).

f. obscura, Haw. (gemina, Hb. 482).

Both Hampson and Warren-Seitz use the name obscura, Haw. for this species.

The satura of the Verz. (1775) p. 84, is said to be the gemina form. It was described by Bork. Naturges., IV. 377 (1792). Teste Wrnbrg. Beitr. II. 175 (1864). H.-S. Bearb. II. 24 (index) also teste.

Tutt Ent. XXII. 302 (1889): Brit. Noct. I. 87 (1891): Smith Cat. Noct. N. Am. 132 (1893): Barrett, Lep. Br. Is. IV. 386 (1897): Stdgr. Cat. IIIed. 175 (1901): Splr. Schm. Eur. I. 194 (1905): South Moths. Br. Is. I. 272 (1907): Hamps. Cat. Lep. Phal. VII. 180 (1908): Warr.-Seitz, Pal. Noct. III. 168 (1911): Culot Noct. et. Geoms. I(1). 162 (1909-13): Draudt-Seitz Am. Noct. VII. 214 (1925).

Ernst and Engr., Pap. d'Eur. VII. f. 471 depict a very brightly variegated form of remissa (1790).

Of his obscura, Haw. said, "Greatly allied to remissa and its affinities,

and probably a variety."

Stephens, *Ill.* II. 181-184 treats remissa, oblonga and obscura as three separate species although with some doubt; and says of oblonga, Haw. "The resemblance between this and remissa is almost too close to warrant their separation."

Treit. Schm. V(1). 346, commends Hübner's fig. 482 as being good but the general colour two dark. He says that 483 is undoubtedly

thalassina.

Dup. Hist. Nat. VI. plt. 91, has a very fair figure of gemina probably representing the intermedia, Tutt. On plt. 107, fig. 5 named anceps, is a very fair figure of gemina but too dark, black brown, for a British example.

Spuler figures remissa, Schm. Eur. plt. 40, 24 in which the sub-

marginal area devoid of marking is rather too dark.

Culot l.c., plt. 30 has good figures of the two dominant forms.

Freyer, N. Beitr. I. 49, says that Hüb. f. 483 labelled gemina is thalassina and notes the fig. of Hüb. 482 as too dark suffused. He says that Hübner's figure 428 remissa appears to have been drawn from an old and worn specimen whereas his own figure plt. 29 is from a fresh bred example. H.-S. says that Freyer's fig. plt. 29 is good but slightly too white in pts. and that the colour of Freyer plt. 29 is better than Hübner's 482.

Neither Hub. nor Frey depict the uniform mottled form with lines and stigmata obscure, which we have been accustomed to call *gemina*, and which agrees so well with Haworth's description of *obscura*.

Wood, Ind. fig. 1663 figures obscura from Haworth's cabinet, p. 240, and fig. 237 depicts a remissa form without any lighter areas (whitish) as in the typical genistae-like typical fig. Hüb. 423. The black

is present.

Her.-Schäf. Bearb. IV. fig. 584, has an exceedingly good figure of remissa, and, l.c., IV. p. 280, says that Hübner's fig. 483 labelled

gemina is thalassina. He also says, l.c., IV. p. 274 that he does not know an example so dark as Hübner's 482 (481 in error) and that the toothed marginal line is incorrect. He does not like the fig. 423 remissa of Hb. The wings are too long, the ground too light, the characteristic basal line is correct, but the central band too much

emphasised and its border near the reniform far too pale.

Of the constantly recurrent "grey form with dark black blotch from — like mark under stigmata, remissa," Barrett says—"In some examples the base of the costa is also clouded with pale grey down to the black central streak; but the central space around the stigmata and the greater portion of the basal hind marginal areas remain of the usual brown-black or purple-brown, and has a striking and distinct appearance, and is constantly mistaken for a different species or mistaken for Hadena genistae."

The remissa form "varies in shade of colour and all intermediate gradations between it and the type are met with; while in northern and western districts its peculiarities are intensified." Those from the Waterford area "unusually large, clouded with bright brown and

the stigmata conspicuously yellowish-white."

Barrett records a very old example which, "has a broad and distinct stripe of pale ochreous down the median nervure, completely dividing the central dark colouring."

He also records "another of an almost unicolorous grey brown."

And he reports a variety from Cork, " smaller dark grey, but the markings all traceable."

From near Waterford Barrett records "the more typical form

tinged with red-brown, and with the stigmata yellow."

The two dominant forms remissa and obscura (gemina) are suggestive of two species at a glance and early authors all considered them as such; even H.-S. treats them as such.

The forms to be considered are:—
remissa, Hb. Noct. 423 (1808).

f. obscura, Haw. Lep. Brit. 189 (1806-10): Wood. Ind. 1663, plt. 52.

ab. oblonga, Haw. l.c.

gemina, Hb. Noct. 482 (1808-1818): Text p. 193.

ab. submissa, Tr. Schm. V(1). 346 (1816-25): Seitz Pal. Noct. III., plt. 40d.

? anceps, Dup. Hist. Nat. VII. 109 (1827) plt. 107, 5.

subsp. indocilis, Walk. Cat. Noct. B.M. IX. 178 (1856): Seitz Am. Noct. VII. plt. 31c.

ab. intermedia-grisea, Tutt Ent. XXII. 304 (1889): Brit. Noct. I. 89 (1891).

ab. intermedia-rufa, Tutt, l.c.

ab. rufescens, Tutt, l.c.

ab. supermissa, Splr. Schm. Eur. I. 194 (1905).

Tutt dealt with (1) gemina and (2) obscura, the obscure form; (3) the intermediate form oblonga with dark costa and fascia and pale stigmata; (4) and (5) intermedia-grisea and intermedia-rufa both with the dark — mark; (6) remissa the genistae-like form; (7) rufescens, a red or brown grey mottled form.

The variation of this species seems to plan out thus:—
Unicolorous finely mottled melanic blackish grey gemina (obscura).

""", "", brownish grey or reddish brown rufescens.
Slightly banded, — below stigma, grey intermedia-grisea.

""", "", ", ", reddish brown intermedia-rufa.
The — mark becomes a dark fascia remissa.

", ", ", with subterminal space light and clear submissa.

The — mark becomes a dark fascia with subterminal space | supermissa. light and clear and basal area also clear | supermissa.

An intermedia form with dark costal fascia including pale stigmata oblone

Barrett, Lep. Br. I. IV., mentions separans as being the American form of gemina.

Grote in his notes on allied and representative species of Noctuidae inhabiting Europe and N. America mentions neither remissa nor

separans, although he gives long lists of species.

Smith says, Cat. Noct. N. Am. 132 (1893), "It is a very close ally in maculation to remissa, or yet nearer to the European gemina, but much darker and with all the pale markings wanting. The W mark in the sub-terminal line is distinct, the orbicular oblique, and there is a broad dash between the ordinary lines." The figure of separans in Seitz is not in accord with this description.

This must have been in error, as Dyar's List of N.A. Lep. gives indocilis, Walk. (remissa, Hb.) and gives separans, Grote, as a distinct

species from it.

Drauat, in Seitz Amer. Noct. VII. 214, says "indocilis, Walkr. (= remissa, Auct.) and on plt. 31c is certainly a remissa form.

Smith says, Cat. Noct. N. Am., 132 (1893) "Walker's type of indocilis is in the B.M. and is this species of Hübner's," remissa.

ab. submissa, Treit. Schm. V(1). 346 (1825). Fig.—Warr.-Seitz, Pal. Noct. III. plt. 40d.

Orig. Descrip.—"var. remissa is the most striking; in a few specimens there runs from the base a distinct reddish-white longitudinal streak below the claviform, in others it starts from the first complete transverse line. The reniform is also bright reddish—mostly united with the similarly coloured waved line. But here I find a very slight transition, distinguished if one gives to it the new name submissa, which stands between remissa and gemina and which has the light area on the hind margin not so light, but the band more distinct than in gemina." Vienna.

indocilis, Walk. Cat. B.M. IX. 178 (1856).

ORIG. DESCRIP.—"Brownish testaceous. Thorax with a black stripe on each side. Forewings with ferruginous black-varied marks along the costa and towards the base, with a large angular one which extends between and behind the discal ringlets, and with two on the exterior border, which is adorned with a row of deep black lunules; the large spot forms a right angle hindwards, and is bounded on the interior side by a double transverse undulating line; hindwings pale

cinereous, with two transverse lines and very broad borders of a brownish hue." New York; Massachusetts.

ab. supermissa, Splr. Schm. Eur. I. 194 (1905).

ORIG. DESCRIP.—"The basal area on the inside of the transverse line, also frequently the costa, becomes considerably paler, and the greyish white or yellowish colour extends much forward, joining with the reniform, while the pale orbicular stands out in the dark central area and inside the waved line there is only the dark claviform near vein III. but the marginal area outside the waved line is much darkened."

Apamea, Tr. (1816-25) Frr., Gn., New. [Polia, Tr. (1816-25) H.-S., Bdv.: Trachea, Tr. (1816-25) Hamps.: Hadena, Schrnk (1802) Frr. Stdgr., Splr.: Parastichtis, Hb. (1822) Warr.-Seitz.] unanimis, Hb. (1808-18).

Tutt. Brit. Noct. I. 90 (1891): Barr. Lep. Br. Is. IV. 387 (1897): Stdgr. Cat. IIIed. 175 (1901): Splr. Schm. Eur. I. 195 (1905): South Moths Br. Is. I. 273 (1907): Hamps. Lep. Phal. VII. 184 (1908): Warr.-Seitz. Pal. Noct. III. 168 (1911): Culot, N. et G. I(1). 163 (1909-13).

Hübner's fig. 556 the type is not a good one. The distinguishing characters of the species such as the reniform, are scarcely in evidence. H.-S. says it is recognisable.

Newman's figure, p. 305, is too large, and also depicts the reniform badly. Unaccountably the text says "larger" than gemina, whereas it

should be "smaller."

Guenée, V. 209 (1852), says that no good figure had yet been made of it.

Freyer, N. Beitr., 144 says that because of the close resemblance of the larva of this species to those of gemina and rurea he thinks it would better be classified in the genus Hadena than in Apamea.

Freyer's fig. plt. 371, is good although the markings are somewhat

too bold. H.-S. says this fig. is good.

Steph., Ill. III. 9 (1829), never having seen it, and trusting to Treit.'s remarks, doubts it as a species. He accepts, l.c. 8, the secalina of Haw. as a species.

Treit., Schm. X(2). 62 (1834), in a long dissertation suggests that unanimis is connected with didyma but, in his Sys. Verz. p. 250, places

it as a var. of gemina.

Wood has a recognisable figure, Ind. 265 (1834).

Warr.-Seitz., Pal. Noct. plt. 40c has a good figure of the typical form and figs. of secalina, and of each of his three newly described forms (see below).

Of the Variation Barrett says—"A little variable in the depth of the ground colour, more so in the extent and intensity of the red-brown or dark marbling; this last being in some individuals almost absent from the dorsal margin and from a broad band beyond the second line, while in others it is uniform to the exclusion of central darker clouding."

Barrett records "one having a broad pale yellow-brown band before the hind margin."

The forms to be considered are: -

unanimis, Hb. Noct. 556 (1808-18).

f. secalina, Haw. Lep. Brit. 210 (1806-10): Seitz l.c. plt. 4c (1911). scortea, H.-S. (Led.), Sys. Bearb. II. Nach. I. 57, fig. 583 (1845).

ab. rufithorax, Warr.-Seitz, Pal. Noct. III. 168, plt. 40c. (1911).

ab. fasciata, Warr. Seitz, l.c. plt. 40d. ab. semiochrea, Warr.-Seitz, l.c. plt. 40d.

ab. nigrobrunnea, Hoffmn., Zt. Öestr. Ent. Ver. I. 14 (1916).

Tutt dealt with the two forms (1) unanimis without the \mapsto mark and without central dark band. (2) secalina with the \mapsto mark and with a darker central area.

f. scortea, H.-S. (Led.).

Staudinger, Cat. IIIed. (1901), included the scortea, H.-S. fig. 583, as this species. H.-S. says, Nachtr. to vol. II. p. 57, that although Lederer considered figs. 482-483 as representing a new species which he named scortea, he himself considered that they were both forms of gemina. The figures are both a close approach to fig. 484 which is rightly named remissa, of which it is a good figure.

Hampson put scortea as a syn. of unanimis, and Warr.-Seitz does

the same.

ab. rufithorax, Warr.-Seitz, Pal Noct. III. 168 (1911).

Fig.—l.c. 40c.

ORIG. DESCRIP.—"With black streak on submedian fold, sometimes with paler basal and submarginal areas, and has the whole head and thorax including the patagia bright rufous." Wiesbaden.

ab. fasciata, Warr. Seitz, l.c.

Fig.—l.c. 40d.

ORIG. DESCRIP.—" Has the median area filled up with dark fuscous, the pale upper stigmata and the inner and outer lines more conspicuous; the head and thorax blackish."

ab. semiochrea, Warr.-Seitz, l.c.

Fig.—l.c. 40d.

ORIG. DESCRIP.—" Has the postmedian area between outer and submarginal lines and the lower part of the median area pale ochreous, and might easily be mistaken for an example of secalis ab. oculea, Guen."

ab. nigrobrunnea, Hoffm. Zeit. Oest. Ent. Ver. I. 14 (1916).

ORIG. DESCRIP.—"Dark brown, almost without marking. The generally light transverse markings are not apparent. The most that can be distinguished is the outer line towards the inner margin. The stigma is outwardly—as in the typical form—finely white margined. This form corresponds to the leucostigma form of H. secalis." Bred from Krieglacher.

Apamea, Ochs. (1816-1825) Frr., Tutt, Barr., South. [Hadena, Schrnk. (1802) Stdgr., Splr., Cul., Meyr.: Trachea, Tr. (1816-25) Hamp.: Polia, Tr. (1816-25) Hb. (1806) H.-S.: Parastichtis, Hb. (1827) Warr.-Seitz,] didyma, Esp. (1786) = oculea, L. (1761) = ?? secalis, L. (1758).

The dates of the publication of the sections of Vol. IV. of Esper (Noct.) are unknown except that on the title-page of IV(1) is the date 1786. Most of the plates were issued long before the letterpress and descriptions, hence early authors attributed the name didyma to Borkhausen. Borkhausen himself refers to Esper's plate but not to the page, hence we may infer that Esper's text dealing with plate 126 was not issued until after Borkhausen's Noctua Vol. IV. was published. Esper has priority. And we find that Esper's text p. 378, to plate 126 f. 7, refers to Borkhausen's text, p. 465. Bork calls 126, f. 7, oculea, Fb. but Esper says that cannot be as it has the characteristic black line of didyma above the inner margin.

Guenée says that didyma is the oculea of Linné and Fabricius. But we have shown ante p. (167), that oculea, L. is the prior name of

nictitans, Linn. Hence didyma, Esp. is the priority name.

Werneburg Stett. e. Zt., 52 (1858), identified secalis, L. as stramentalis, Tr. This, after becoming acquainted with the citation quoted by Linn., viz. Rolander in Acta Holm. 62 (1752), he considered an error, and said that on the evidence of all three stages it was the achrolenca, Tr. cf. Fuess. Neu. Mag. II. 355.

Schöyen, Stett. e. Žt. 389 (1879) discusses the identity of secalis, L. at great length and finally decides that didyma, Esp. is secalis, L. in spite of Linné's own statement that it is a Pyrale. Stdgr., Hamp., South,

and Warr.-Seitz use secalis, while Meyr. uses didyma.

Werneburg, ascribes the brunnea, Hüfn. to didyma, Tr. Hufnagel's description runs "Whitespot, dull brown with darkbrown shading and a white spot in the middle of the fore-wing," which Werneburg says denotes the lighter variety of didyma. He goes on to say that the citation of Kleemann. plt. X. fig. B. by Rottemburg to brunnea, Hüfn. is quite excusable, since the figure is so poor, but that the notes of Kleemann are quite conclusive that he was giving a figure of nictitans.

Tutt. Brit. Noct. I. 91. (1891): Barrett, Lep. Br. Is., IV. 394 (1897): Stdgr. Cat. IIIed. 175 (1901): Splr. Schm. Eur. I. 195 (1905): South, Moths. Br. Is. I. 274 (1907): Hamp. Lep. Phal. VII. 211 (1908): Warrseitz., Pal. Noct. III. 171 (1911): Culot Noct. et G. I(1). 163 (1909-13).

Ernst. and Engr. Pap. d'Eur. have 9 figs. on plts. 256-7 Vol. VI. Treit. l.c. V(2) 87 points out that Hb. in his text cites secalina to no. 19 on p. 183 instead of to no. 18. the fig. Hb. 420 being secalina.

Freyer says, Neu. Beitr. I. 139, that Esper's fig. 6 on plt. 47 (126) as well as the accompanying description belong to true nictitans = chrysographa, Hb.; but that fig. 7. l.c. was certainly didyma to which Hübner's fig. 420 secalina was undoubtedly to be referred.

Freyer, New. Beitr., plt. 443, has two figs. of didyma both good. The second is very comparable to the vilis, Hb., but has the white markings, lines and dots very delicately put in, while in Hb's fig. they

are very thick and hard. The ground colour is the same.

H.-S., Bearb. II. 274, criticising figures of authors, says, Freyer. I. plt. 75 recognisable; Hb. 619, 620 (nictitans) usual red-brown specimens; Hb. 97 quite unrecognisable; Hb. 420 (seculina) a large fresh coloured example; Hb. 511 (vilis) "I can in no sense place it here." He puts oculea, Fb. and leucostigma, Esp. as synonyms of didyma (Bork.) Esp.

H.-S. says, l.c. II. 275, "The colour of moderata is brown-grey duller than that of all specimens of didyma. The reniform is smaller, narrower, without any appearance of white, the marking on the inner portion of the margin very sharp, veins 3 and 4 are somewhat lighter where they start from it." The example was supplied by Eversmann

himself.

Warr.-Seitz. gives 12(10) figures. 1. I-niger should be I-niger-albo, 2. didyma, 3. oculea, 4. rava should be rava-flavo, 5. grisea probably grisea-flavo, 6. reticulata should be reticulata-flavo, 7. nictitans but does not show the black — characteristic of nictitans, 8. leucostigma should be albostigma, 9. pulverosa, and 10. lilacina both new forms, 11. moderata treated as a true species, 12. struvei also treated as a true species.

Culot, N. et G., I(1), gives beautiful figures of oculea, Gn., secalis, armoricae, nictitans, leucostigma, lugens, struvei (2). Neither of the two figures of struvei are pure white in the characteristic area, as descriptions

in Hamp., Seitz and Culot state.

Barrett describes the variation thus:—"Variable in an extraordinary degree in all localities. The most abundant is that of those
having the forewings brown in some shade, marbled or mottled all over
with darker; but one of extreme frequency has also a faint or more
distinct central band from a blackening of the space between the first
and second lines; and another, also plentiful, has the dorsal margin
and the broad band between the second and subterminal lines of some
light bright brown, while the enclosed portion forms a very large,
darker red-brown, purple brown, or umbreous triangle along the costal
half of the wing; these characters are partially combined in those
specimens which with the broad pale hinder band have a dark central
space, and in these there is in some individuals a deep black horizontal
bar, above the dorsal margin, joining the first and second lines.

"Another and rather different range of variation is of uniform deep purplish brown to brown black, or dull black, often with the subterminal line more visible and yellow, or dotted with yellow; often also with blacker marbling on the central band; very often with a brightly contrasting yellow, orange, or white reniform stigma. It may be remarked that this stigma is most eccentric in colour, varying through yellow, brown, and white, in every different form of the insect, and apparently in no way governed by any tendency in them to be darker or paler. In all varieties the thorax follows the colour of the forewings, except that the back crest, or the portion lying between its tufts is erratic in colour, usually not differing, but in some examples without reference to their colour, yellow, orange, reddish-brown, or

even chestnut."

Barrett records a specimen, "of which the dorsal half of the wing and the broad hinder band are of a pale cream colour, with the costal region and hind marginal clouds blackish brown."

He also records another "from Ireland which is actually tinged

with rosy-purple."

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The names and forms to be considered are as follow.—
    [secalis, Linn. Sys. Nat. Xed. 519 (1758).]
    [oculea, Linn. Fn. Suec. 132 (1761)].
   ?? bombycina, Hufn. Berl. Mag. III. (1766).
   didyma, Esp. Abbild, IV. 378, plt. 126, 7 (1786).
   ab. lancea, Esp. l.c. IV(2). 663. plt. 174 (1786?).
   ab. nictitans, Esp. l.c. IV. 375. plt. 126. 6 (1786).
   ab. lencostigma, Esp. l.c. IV(2). 542. plt. 159 (1786?).
   lamda, View. Tabell. II. 81 (1790).
   ab. secalina, Hb. Noct. 420 (1808).
   ab. I-niger, Haw. Lep. Brit. 210 (1806-10).
   ab. rava. Haw. l.c. 209 (1806-10).
    [ab. secalina, Haw. l.c. 210 (1806-10.]
   ab. furca, Haw. l.c. 209 (1806-10).
   ab. lugens, Haw. l.c. 212 (1806-10).
   ab. vilis, Hb. Noct. 511 (1808-18).
   ab. moderata, Evers. Bull. Mosc. 547 (1843).
   ab. oculea, Gn. Noct. V. 210 (1852).
   ab. struvei, Rag. Nat. Sicil. IV. 274, plt. 4. f. 7 (1885). Culot N. &
G. I(1). 164 (1909).
   ab. grisea-albo, Tutt. Brit. Noct. I. 93 (1891).
   ab. grisea-flavo, Tutt. l.c.
   ab. reticulata-albo, Tutt. l.c.
   ab. reticulata-flavo, Tutt. l.c.
   ab. secalina-albo, Tutt. l.c.
   ab. secalina-flavo, Tutt. l.c.
   ab. I-niger-albo, Tutt. l.c.
   ab. virgata-albo, Tutt. l.c.
   ab. virgata-flavo, Tutt. l.c.
   ab. oculea-flavo, Tutt. l.c.
    ab. rufa-albo, Tutt. l.c.
   ab. rufa-flavo, Tutt. l.c.
    ab. nictitans-linea, Tutt. l.c.
    ab. secalina-linea, Tutt. l.c.
    ab. rava-flavo, Tutt. l.c.
    ab. didyma-flavo, Tutt. l.c.
    ab. furca-flavo, Tutt. l.c.
    ab. nigra-atbo, Tutt. l.c.
    ab. nigra-flavo, Tutt. l.c.
    ab. lugens-flavo, Tutt. l.c.
    ab. alhostigma, Tutt. l.c.
    ab. uniformis, Splr. Schm. Eur. I. 195 (1905).
    ochracea, n.ab. (Hamp.) Cat. Lep. Ph. VII. 212 (1908).
    ab. atrocyanea, Krul. Rev. Russe. IX. 307 (1909).
    ab. armoricae, Cul. (Obthr.) Noct. et G. I(1), 164. plt. XXX. f. 7
(1909-13).
    ab. lilacina, Warr.-Seitz, Pal. Noct. III. 171, plt. 40h. (1911).
    ab. pulverosa, Warr-Seitz. l.c.
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ab. binota, n.ab. ab. albo-excessa, n.ab.

Tutt dealt with the following forms :-

A. Ground colour: - Whitish grey, grey, or yellowish grey.

I. Unicolorous form.

- Without
 mark { a. Whitish reniform = grisea-albo.
 b. Ochreous reniform = grisea-flavo.
 Reticulated form.
- 1. Without \vdash mark $\begin{cases} a. & \text{Whitish reniform} = reticulata-albo. \\ b. & \text{Ochreous reniform} = reticulata-flavo. \end{cases}$
- 2. With \vdash mark a. Whitish reniform = secalina, var. γ , Haw. b. Ochreous reniform = secalina-flava.

III. Central banded form.

- 1. Without $= \max_{b} \frac{a}{b}$. Whitish reniform = rirgata-albo.
- 2. With \mapsto mark a. Whitish reniform = I-niger-albo. b. Ochreous reniform = I-niger, Haw. IV. Dark costal form.
- 1. Without \mapsto mark $\{a. \text{ Whitish reniform} = oculea, \text{Gn.} \\ b. \text{ Ochreous reniform} = oculea-flavo.}$
- B. Ground colour:—Ferruginous red, reddish brown, or purplish brown.
 - I. Unicolorous form.
 - 1. Without $\mapsto \max \left\{ \begin{matrix} a. \text{ Whitish reniform} = rufa\text{-}albo. \\ b. \text{ Cchreous reniform} = rufa\text{-}flavo. \end{matrix} \right.$
 - II. Reticulated form.
 - 1. Without $\mapsto \max \{a. \text{ Whitish reniform} = nictitans, \text{ Esp. Hb.} \\ b. \text{ Ochreous reniform} = secalina, \text{ Hb.}$
 - 2. With → mark

 (a. Whitish reniform = nictitans-linea.

 (b. Ochreous reniform = secalina-linea.

III. Central-banded form.

- 1. Without \vdash mark $\{a$. Whitish reniform = rava, Haw. b. Ochreous reniform $= rava \cdot flarv$.
- 2. With \mapsto mark $\begin{cases} a. & \text{Whitish reniform} = didyma, \text{ Esp.} \\ b. & \text{Ochreous reniform} = didyma-flavo. \end{cases}$

IV. Dark costal form.

- 1. Without \mapsto mark $\{a$. Whitish reniform = furca, Haw. b. Ochreous reniform = furca-flaro.
- C. Ground colour :- Black.
 - I. Unicolorous form.
 - 1. Without $= \max \{a. \text{ Whitish reniform} = nigra-albo. \\ b. \text{ Ochreous reniform} = nigra-flavo. \}$

II. Reticulated form.

- 1. Without \vdash mark $\begin{cases} a. & \text{Witish reniform} = lugens, \text{ Haw.} \\ b. & \text{Othreous reniform} = lugens-flavo. \end{cases}$
- 2. With \mapsto mark \(\langle a\). Whitish reniform = albistigma.
- b. Ochreous reniform = leucostigma, Esp.

Warr.-Seitz. says (1) lamda, View., lancea, Esp., rilis, Hb. are synonyms of secalis, L. (2) ab. didyma, Esp. is secalina, Hb. (3) ab. oculea, Gn. is doubtfully oculea, L. (4) ab. reticulata, Tutt is doubtfully ab. uniformis, Splr. (5) ab. leucostigma, Esp. is lugens, Haw.+nigra, Tutt,+albistigma, Tutt. (6) Treats moderata, Ev. as a true species, "Quite distinct from secalis," (7) Treats struvei, Ragusa as a true species.

Tutt considered moderata as doubtfully the same as ab. grisea.

secalis, Linn. Sys. Nat. Xed. 519 (1758).

Orig. Descrip.—" Noctua spirilinguis cristata, alis deflexis:

superioribus griseo-fuscis striatis: macula reniformi A latino."

This species was not included in the Fn. Succ. (1761) by Linn. but in the Sys. Nat. XIIed. 882 (1767) it was transferred to the Pyrales.

bombycina, Hüfn., Berl. Mag. III. 410 (1766).

Werneburg Beitrage I. 252 (1864) says "Concerning bombycina of which Rottemburg found no longer in Hufnagel's collection, the diagnosis runs "Grey with brown markings, a whitish encircled space and white reniform stigma. On the stems of trees. Rare." Since this deals with a moderately large noctuid, and Hüfnagel mentions no transverse lines, which are certainly very non-apparent in advena, and for which also the rest of the diagnosis passes, I consider my determination as well grounded." i.e. = advena.

ab. lancea, Esp. Abbild. IV(2). 663, plt. 174, 5 (1786?).

This figure may be anything. Werneburg say that this is brunnea, Hufn. = didyma, Tr. From the description one infers that this lancea is none other than a variety of didyma with lighter suffused bands and

coppery red terminations of the stigmata.

Esper's description is a long one. The ground colour is reddish strewn with black spots and atoms. A light submarginal band bordered on both sides with a yellowish line, curved inwards and toothed near the costa outwardly. From this band extends above the inner margin a broad blacker streak, elongated both ways. The stigmata are also margined with yellowish. The reniform has two black dots towards the inner side and a similar black lunular-streak. The oval stigma is lengthened. The outer margin has yellowish dots and the edge is black brown. The hind wings and the undersides are of pale red-colour and only have an obsolescent blackish marginal area. Both sides are somewhat glossy.

The description and the figure do not agree, both being unsatis-

factory.

lamda, View. Tabell, II. 81 (1790).

ORIG. DESCRIP.—"The fore-wings are yellowish brown on the outer margin. Across the disc runs a brown transverse line, margined on both sides by a pale line; on the outer side of this, there lies, towards the upper margin a brown whitish mixed reniform stigma, and before this another circular spot wholly brown and almost obsolete; under it lies a black longitudinal line running out to two points. On the outer margin stands a small black spot white in the middle just in front of which lies an angled pale transverse line. Besides this one finds a short black streak at its commencement. The body and hind wings are dark grey." Berlin.

Werneburg, II. 216, says this is the brunnea, Hüfn, and the didyma,

Tr. This is accepted by Hampson (Lep. Phal.)

ab. vilis, Hb. Saml. Noct. 511 (1808-18) Text. 175 (1805-18).

ORIG. DESCRIP.—"Red brown: Head and thorax dark scaled: the forewings very dark, with chalk white reniform and waved-lines, which are mostly broken up: the lower wings and abdomen brownish grey,

S. Tyrol." This is an inadequate description of a very remarkable specimen (aberration) which \hat{H} .-S. says he can under no consideration place here. Hampson accepts it as a synonym of didyma.

Description of vilis, Hb. fig. 511.

The size of didyma. Of a very dull uniform brown with a slight shade of chestnut in it. The markings, chalky white and very conspicuous, consist of 2 or 3 small white dots near base of costa, a line midway between base and reniform somewhat waved, a reniform a large white blotch with a dark curved line in the middle, the curve hollow outwards, a broken continuation of this stigma to costa and to inner margin, a few spots from costa parallel with the reniform, a row of submarginal dots, with lighter brown fringes. Possibly the spots outside the reniform and those below may represent the elbowed line much broken in the middle.—Hy.J.T.

ab. moderata, Evers. Bull. Mosc. III. 547 (1843).

Fig.—Seitz. Pal. Noct. III. plt. 40h.

Orig. Descrip.—" Alae anticae olivaceo fuscae, nebulosae, fascia lata externa pallidiore unicolore;—posticae fuscescentes."

"Of the same size and appearance as didyma and similar to it.

"Alae anticae a basi usque ad strigam seu lineam transversam externam ordinariam olivaceo-fuscae, nigro-nebulosae, linea transversa interna maculisque ordinaris pallidioribus, his fusco inscriptis: extra lineam externam sequitur, fascia seu spatium latum olivaceo-fuscescens unicolor, sine umbris, externe spatio angustissimo terminali bis sinuato limitatum; cilia fusca, pallido-varia. Alae posticae fuscae, aut fuscescentes, externe sensim obscuriores. Subtus alae sericeo-nitidae: antice e luteo et griseo fusconigricantes; posticae sordide lutescentes, pulvere fuscescenti paululum adspersae punctoque medio obsoleto: omne margine externo pallidiore strigaque externa obsoleta obscuriore."

Habitat in promontariis Uralensibus.

ab. moderata, Evers. Fn. Volg. 240 (1843-1844).

FURTHER NOTES.—A further description appeared in Fn. Voly.

1844 = 1843 (see back of title-page.)

"Alae anticae thoraci concolores, fusco-olivaceae, fusco-nebulosae, spatio submarginali latius-culo, olivaceo unicolore, spatio terminali angustissimo fusco, maculis ordinariis pallide circumscriptis;—posticae fuscescentes."

"Very like didyma, differs by the olivaceous colour and by the submarginal area being devoid of clouding. Habitat in the Ural

mountains, etc."

In his 1856 notes he uses the word "pallidiore" of the subterminal area and adds "lineis medianis crenulatis fuscis" and "linea subterminali sinuata, edentata." He adds "southern" to Ural Mts.

This seems to be exactly like didyma in disposition of marking, size, etc. but is of a distinct colour, suffused somewhat with olivaceous.

ab. struvei, Ragusa, Nat. Sicil. IV. 274 (1805) plt. 4.

The author does not describe the aberration but refers it to the

description given by Berce, Noct. France III. p. 106 (1870).

ORIG. DESCRIR.—"Basal and subterminal areas white." On his plate Ragusa figures a "didyma" form as struvei which does not agree with the above description at all and must be discarded. Its description

is "base dark mottled to the first transverse line or band which is white centred by a dark line, making really a doubled line. The discal area is similarly dark mottled, the reniform having a still darker centre with a well defined broad white line along its inner margin. The immediately succeeding white band is fairly wide but split up into three by two dark lines. Outside this the marginal ground is of the same mottling with a portion of a wide white line just below the apex losing itself in the ground about the middle of the margin." This figure certainly does not apply to the described struvei.

Hampson says "suffused with white." But the figure is not so.

Culot, Noct. et G. I(1). plt. 30, 11, figures a specimen in Turati's collection sent to him by Ragusa himself in which the basal and subterminal areas are suffused with very light coloration and may be accepted as typical instead of the figure in Nat. Sicil.

ab. uniformis, Splr. Schm. Eur. I. 195 (1905).

Orig. Descrip.—"A unicolorous, very slightly finely marked reddish yellow grey distinct form, which is found far and wide but very sparsely."

ab. atrocyanea, Krul. Rev. Russe. IX. 307 (1907).

Orig. Descrip.—In Russian only "Alis anticis atris, cyaneo micantibus, picturis omnibus indistinctis, macula reniformi nivea." Very rare in the oriental provinces of Russia.

ab. Hamp. Cat. Lep. Ph. VII. 212 (1908).

ORIG. DESCRIP.—"Fore-wing rufous, the costal area to subterminal line, the cell and area below it to submedian fold, and the terminal area except at apex suffused with fuscous." This is very much like Tutt's furca-flavo.

ab. Hamp. Cat. Lep. Ph. VII. 212 (1908).

ORIG. DESCRIP.—"Forewing with the ground colour brownish ochreous, the costal area to subterminal line, the cell and area below it to submedian fold, and the terminal area except at apex suffused with fuscous." This does not appear to fall in Tutt's scheme, and I suggest the name ab. ochracea, ab. nov.

ab. armoricae, Obthr. Culot. Noct. I. 164 (1909-13).

Fig.—1.c. plt. XXX. f. 7.

Orig. Descrip.—Culot does not describe in words this striking (très claire) aberration, but figures it on plate 30, of vol. I of his *Noct. et.* Geom. fig. 7 under the name armoricae. The specimen was taken at

Huelgoat, Finnistere.

The coloration is of a very light ochreous sandy shade, the forewings somewhat darker basally, with blackish claviform tie to the two weakly expressed transverse lines, an orbicular defined by two oblique curves, a reniform less clearly defined but with a pure white centre, and a few scraps of marginal markings. The hindwings uniformly pale. I have not seen an example with the colour and markings so washed out as it were.

ab. armoricae, Obthr. var. taken by Dr. Cockayne.

ORIG. DESCRIP.—" A whitish insect, ground colour palest grey with

slight yellow or ochreous tint. The markings are very distinct, those limiting the orbicular and reniform nearly black and the bar postericity also nearly black, those below the stigmata and near the termen, very dark grey-brown, those at base and apex palish grey-brown." ? Oxshott.

This would appear to be a variation on armoricae, Culot, N. et. G. I(1). plt. 30. 7. in which the ground is paler and the marking more emphasised in black.

ab. lilacina, Warr.-Seitz Pal. Noct. III. 171 (1911). Fig.—l.c. 40h.

ORIG. DESCRIP.—" Has a dull lilac grey ground colour in basal and postmedian areas, with the median area and the terminal more diffusely dull rufous brown; the inner and outer lines and the reniform stigma filled up with lilac grey; pectus and legs paler but strongly tinged with violet; anal tufts fulvous." Silvaplana, Engadine.

ab. pulverosa, Warr.-Seitz Pal. Noct. III. 171 (1911). Fig.—l.c. 40h.

Orig. Descrip.—"Somewhat like ab. reticulata, Tutt, but darker, suffused with brown and clouded, especially along costa, with blackish fuscous, in places thickly irrorated with whitish scales; veins strongly dusted with dark and pale scales: inner and outer lines distinct, filled up with ochreous; subterminal line brownish ochreous preceded by a deep brown cloud and followed by dull blackish terminal blotches on both folds; claviform and orbicular dull, brown, with black edges; reniform large, the inner half dark with a dark edged central brown lunule, the external margin yellow ochreous, except at lower end, which is white; hindwing dark fuscous, head and thorax black brown." Pescocostanza, Italy.

binota, n. ab*.

Orig. Descrip.—" The ground colour is nearly black. The reniform is white and there runs out from it to the line limiting the central area a further patch of white." Forres. The appearance is as if the reniform were duplicated. Dr. Cockayne has seen two rava with the same additional white mark.

struvei-excessa, n. ab.

ORIG. DESCRIP.—"Ground colour white, markings nearly black. The broad submarginal area is white, the basal area very largely white, and thus far resembling struvei, Ragusa, but in addition the area uniting these two areas along the inner margin is white and very wide, with only a thin irregular line crossing it, the vestiges of the transverse line." ? Kingsgate.

Miana strigilis and M. latruncula.

For many years a number of named forms have been associated by most collectors with that known as *strigilis*. But now and again the real student of the lepidoptera felt that there were at least two species

^{*} I think any form with the additional white should fall under this name. Mine happened to be blackish, but the two others were rava. All three were from Forres.—E.A.C.

associated together (1) that which was generally the larger and with chalky white colour and (2) that which was smaller and sturdy of a black, black brown, or reddish tinge usually. But not until the advent of the study of the genitalia was there any stable character to differen-

tiate the two with certainty.

In 1907 in the Schrift. Phys. ock. Ges. Konigs. p. 75, Dampf differentiated the two species by their genitalia. And in the same year Petersen in a more detailed paper in the Rev. Russe. d'Ent. vol. VII. p. 206, showed definitely that latruncula was not a form of strigilis. Both the above communications appeared in local and little distributed publications, and the information was more or less hidden from general knowledge.

DIFFERENTIATION BY GENITALIA.

Genitalia of Miana latruncula and of M. strigilis.

Dampf. Schrift. Phys. ock. Ges. Konigsb. p. 75 (1907).—"Latruncula is not an ab. or a var. of strigilis, but a true species, as Rossler rightly conjectured. The examination of the genital organs give a constant difference between the two forms. The tooth on the lower margin of the valve in the 3 of M. strigilis is long and pointed (bodkin-like), in M. latruncula shorter and conical; we also found a similar difference in the snout-like apex bent downwards at the free-end of the valva. The other differences are best seen on the attached figure. The 2 of M. strigilis possesses a distinctly longer "ductus bursae" which before the ostium of the bursa is swollen out into a globular shape. In M. latruncula the ductus is shorter and shows no striking enlargement. Similarly constant distinctions are found between the outer genitalorgans of the females of the two species." Figures of the male organs of the two species were given.

Petersen Rev. Russe. d'Ent. VII. 206 (1907).—After referring to Rossler's conjecture and to the discovery of Dampf that it was an actual fact that latruncula was neither an ab. nor a var. of strigilis but a good species, Petersen goes on to confirm the discovery, and gives figures of the organs of both sexes of both species more in detail than does Dampf. He says that the distinctions of the two species are so constant in a long series of examples without any intermediate occurring, that it leaves no doubt whatever but that there are two species. He has examined Estland, German and Tyrolese series. "The valve of the 3 shows the Hadena-type of modification; the axe-shaped form of the distal end of the valve is rounded at the front angle, produced at the back angle into a continuation, which in profile looks not unlike the head of a bird; the "bill" in strigilis is distinctly longer than in latruncula, in the former 4 times, in the latter twice, as long as the width. The projection arising from the lower edge of the valve is in strigilis, as Dampf stated, bodkin-like and longer, in latruncula conical and shorter. At the base of this projection on the basal side of the upper margin of the pocket, one finds a projection in strigilis, which is absent in latruncula. At the foot of the penis-body in latruncula in front and below lies a strong conical tooth, while in the corresponding position in strigilis there is only to be seen a chitinous thickening with three fine points. In the 2 the essentially distinctive character, by which one can with certainty distinguish the species, lies

in the surround of the ostium of the ductus bursae. In strigilis this is abruptly strongly widened, developed almost globular, deeply indented on the outer side, in latruncula it is only shallow and gradually runs into the ductus bursae. The inner chitinous plate margining the ostium ventrally is wide in strigilis, narrower in latruncula." There are further differences. Petersen based his results on the examination of at least 1700 examples.

Two years later we have the evidence of a British observer as follows:—

Genitalia of Miana strigilis, Pierce, Noctuidae p. 33, plt. xiii. (1909). "I examined a great number of this, and the other species of the Miana, of every variety." "Harpe angulated, with corona; cucullus divided, the anal angle produced and lobed, the lobe being thickly clothed with spines; below the cucullus on the outer edge is a straight arm; clasper not produced; ampulla rounded; clavus peaked, bulbed at the base, and clothed with short hair; uncus narrow waist, diamond pointed; vesica with curved bulbed cornutus; juxta without side spines."

It is very remarkable that not a single *latruncula* was found in the great number examined. For the skill of the observer is unassailable.

At a meeting of the South London Entomological Society in April, 1930, Mr. W. H. T. Tams stated that he was convinced that under the name *strigilis* there were two definite species and illustrated his remarks by sketches of the genitalia.

Dr. E. A. Cockayne has independently confirmed the observations of Dampf and Petersen and has no doubt whatever that there are two

species which he can readily distinguish by their facies.

DIFFERENTIATION BY MARKING, ETC.—Dr. Cockayne says "I have examined genitalia of many British specimens from various places and find no difficulty in dividing them correctly by eye first. There are no intermediate genitalia. Both have forms with and without the black bar as in didyma. (This is probably inherited as an independent character in these species and in didyma)."

"Strigilis. Almost always larger.

"(1) Various black and white forms from very pale to very heavily and darkly marked.

"(2) Suffused all over with grey—no brown tinge.

Note.—"I have two strigilis as black as the black latruncula, one with the black bar the other without, and two with the usual white markings somewhat suffused with grey.

"I have seen one British brown strigilis and such are said to

occur on the continent." He further says (in lit).

"I see no clear cut division between the lightest strigilis and the darkest of these with white markings. Nor do I see any clean cut division between the various forms of latruncula."

"Both strigilis and latruncula have forms with and without the

black bar below the stigmata.

"I have a latruncula with greyish white (nearly white) submarginal band but the stigmata are of the same colour as the ground, darkish grey brown and the other markings are not much darker; the termen is also bordered with uniform grey brown. It has none of the clean cut black and white of strigilis."

Latruncula. Smaller.

"All shades of brown to unicolorous black. The palest do show some definite markings much like those of pale *striqilis*.

"I have a single specimen with white and blackish markings

rather like a strigilis."

In the Proc. S. Lond. Ent. Soc. p. 39 (1930-31) I have summed up the recorded differences between strigilis and latruncula as follows.— "Striailis has a somewhat larger expanse than latruncula; & up to 26 mm., 2 28 mm., against 24 mm., (latruncula) and has somewhat narrower and more pointed forewings. In typical strigilis the ground colour is a pure blackish grey without brown powdering, while latruncula is brown. The marginal area in strigilis has chalk white in it. replaced in latruncula with pale brown suffusion, although some may have impure white markings occasionally. The outer transverse line is in strigilis strongly bent inwards towards the inner margin, but is more straight in latruncula. In its upper part in strigilis, as a rule, on the outer side there are five distinct black streaks which in latruncula are very weakly developed or wholly wanting. In latruncula there stands almost always between the transverse line and the claviform a blacker streak-like spot, which unites with it to form a black bridge joining the two transverse lines. In strigilis this mark is absent or if present very obsolescent. The fact of both species having parallel series of similar variations emphasises the confusion."

Miana, Steph. (1829). Tutt, Gn., Barr., Splr. [Oligia, Hb. (1822) Hamps.: Parastichtis, Hb. (1822) Warr.-Seitz.: Apamea, Tr. (1816-25) Freyer, Tr.: Hadena, Schrnk. (1802) Meyr.] strigilis, L. (1758) and latruncula, Schiff. (1775).

Tutt's citing strigilis to Clerk was an error (Brit. N. p. 99). He quoted the description of strigilis from Linn. S.N. XIIed and did not refer to the prior works except Clerck's Icones. Strigilis was redescribed in the XIIed, S.N., from the Fn. Suec. p. 318. (1761). In Sys. Nat. (1758) p. 516 is the prior description, thus strigilis must be cited to L. and not to Clrk. In his descriptions subsequent to (1758) Linn. substituted "prior" for "fusca."

Strigilis, Linn. Sys. N. Xed. 516.

ORIG. DESCRIP.—"Alis deflexis nebulosis: denticulis setaceis intra fasciam albam terminalem." "Alae griseo-cinereae tribus annulis ovalibus nigris; facia alba alas terminans latior, intra quam area fusca inferit 5 vel 6 striae nigras fere ad ejus medium." The description of the type, and different from Clerck's description which is possibly that of a latruncula form.

Tutt does not place the *strigilis* of Linn. although he states it differs from that of Clerck, nor does he refer to the *strigilis* of Haw. According to Haw. himself he says that both his *praeduncula* and his *strigilis* are the same as the *strigilis*, Linn. of the Fn. Suec., and that he hesitated whether he should unite the three slightly differing species (= forms) praeduncula, *strigilis* and *latruncula* into one species.

The descriptions of strigilis, Linn., praeduncula, Haw., and strigilis, Haw. are only very slight differences of the same form, and almost negligible for differentiation. Strigilis, Haw. is said to be a little

smaller than praeduncula, but scarcely differs except in the black connecting streak which is constant in all forms.

Tutt put Haw. as the authority for both latruncula and praeduncula whereas Schiff. Verz. p. 89 (1775) introduced both latruncula and praeduncula among their "Kleine Eulen" characterised by small size, having on the very dusky dependant forewings a transverse band which narrows inwardly and is narrowest on the inner margin, with a white waved little streak on its edge. On the abdomen stands a small single tuft. The latruncula has its narrow forewings brown varied with red: the praeduncula has its narrow forewings brown with white in the marginal area.

Tutt Brit. Noct. I. 99 (1891): Barrett Lep. Br. Is. V. 12, plt. 186 (1899): Stdgr. Cat. IIIed. 164 (1901): Splr. Schm. Eur. I. 181, plt. 41 (1905): South Moths Br. Is. I. 275, plt. 134, figs. 1, 4, 7, 10, 13, 16 (1907): Hamps. Lep. Phal. VII. 381, fig. 63 (1908): Culot Noct. et. G. I(1). 122, plt. 21, figs. 16-18 (1909-13).

Esper's figure, IV. plt. 146, 1, 2, 3? are bad portraits of *strigilis*; the figs. 4, 5, 6 Esper calls var. aerata. Werneburg calls the latter

strigilis var. without comment.

Esper's figures 4, 5, 6 are quite distinct from one another, fig. 4 a very light brown form resembling strigilis without any white. Figs. 5, 6, both apparently "alis cupreo-micantibus" are more alike, while 5 has some of the marking clearly visible, fig. 6 has all but the outer waved line obsolescent, smooth shining brown. Freyer says that figs. 2 and 3 are more certainly latruncula than strigilis. Fig. 3 has the reddish coppery colour of latruncula.

Esp. l.c. re aerata plt. 146, figs. 4, 5, 6 in his Text. p. 469 calls

fig. 6 latruncula.

Esper's fig. on plt. 162 called latruncula was corrected in the text p. 557 to aerata.

[It is noted in Pap. d'Eur. VIII. 38 that the description of Esper's

fig. IV. plt. 146, (1786), had not been published in 1792.]

Ernst and Engramelle, Pap. d'Eur., VIII. figs. 550-1, have 7 figures of strigilis-latruncula. In the text p. 38 the authors say that 551a, c are the strigilis, L. and they consider that the figures 550a, b, c, e, f, are so like strigilis in every respect but colour that they must be considered as varieties of it. Werneburg, Beitr. II. 123, says that 550a, b, c, are latruncula, Schiff. and that b. with whitish in the border is the form rubeuncula, H.-S.; 550e, f, are also latruncula, but e is an extraordinary figure, which may belong here as a rare form; and 551a, c, are strigilis, L. One would agree with this except that 550f, is strigilis rather than latruncula.

Borkhausen, IV., seems to have mixed up several species with strigilis, etc. Werneburg points out that on p. 174 his latruncula is strigilis, L. var. latruncula, Schiff.; on p. 175 his praeduncula is fasciana, L.; on p. 176 his furuncula is latruncula, Schiff. var.; on p. 187 his meretricula is latruncula, Schiff. var. (teste Bork. in Rhein. Mag. I); and

on p. 188 his versicolor is strigilis, L.

Hübner has three figures, 94 latruncula, 95 praeduncula, and 776 latruncula. 94 and 776 have nothing in common as regards colour. In Hübner's Text. he alters praeduncula to strigilis, L., p. 183 and says that 94 latruncula is aerata, Esp. p. 184. To this latter Tutt agrees, but strangely does not refer to either of the other figures of

Hübner. Hübner's fig. 776 seems to be a small example of aethiops,

Haw. [fig. 776 is Geyer's, after Hübner's death.]

Boisduval put rubeuncula, Ramb. as a form of latruncula, Ind. Meth. no. 901 (1840), but Donzel and Freyer both think it is a true species (Frr. N. Beitr. V. 143).

Wood. Ind. 274-6, has good figures of the same three.

Guenée recalls the fact that Freyer figures strigilis and latruncula with unlike larvae, but he (Guenée) states emphatically that he has observed no difference between the two and that Freyer's figures have not been verified in nature. Dr. Cockayne says (in lit.) "I agree with Guenée's statement. I can see no difference. If there be one it must be very slight indeed."

Like many continental lepidopterists Guenée puts fasciuncula as a form of the strigilis-latruncula complex. He recognises praeduncula,

Schiff., etc., as strigilis.

Guenée points out that in *latruncula* the subterminal line is preceded by a ferruginous tint and also that in *aethiops* this tint is traceable.

Guenée describes latruncula "All individuals in which the grey-white of the subterminal space is replaced by grey-brownish. The

subterminal is generally preceded by a ferruginous tint."

Werneberg, Beitr. I. 518, says "I accept the determination of Lederer that latruncula, Tr., is not specifically distinct from strigilis, L.; I have no hesitation in placing together strigilis, Fb.. with praeduncula, W.V., which is certainly latruncula, Tr., the variety with more whitish mixed band."

Staudinger, Cat. IIIed. (1901), treated latruncula as an ab. of

strigilis.

Spuler notes, Schm. Eur. I. 181, 1906, that Hormuzaki's intermedia is the dusky form of latrunchla parallel to the aethiops of strigilis.

Rebel, Berge-Reb. (1909) treats latruncula as an ab. of strigilis, more reddish brown, the outer band pale brown (not white), mostly smaller

but equally common.

Rebel says, Berge-Reb. (1909), p. 189, that intermedia, Hormuz., without the lighter area in the submarginal field, is identical with the latruncula, Haw., of Tutt's tabular scheme, Brit. Noct. I. 99. It would appear to be the var. β of Haw. named unicolor by Tutt.

Warr.-Seitz, l.c. plt. 40, gives eleven figures but not one of the typical strigilis, L. The nearest is that called praeduncula; latruncula is next, a brown form; aerata; fasciata, which agrees with Tutt's description; suffumata, an extreme form of the last; virgata; 2 of aethiops, one can be allotted to latruncula with just a shade of a brown outer marginal area, the other a strigilis form with a grey shade; intermedia, Hormuz.; unicolor; terrea, Warren.

Warr.-Seitz, Pal. Noct. III. (1911), treated latruncula as a form of strigilis, and aerata as an extreme form of latruncula with a more or less rufous tint, instead of the pale more or less luteous outer band.

Culot, Noct. et G. (1909-13) says on the authority of Stdgr. that

latruncula is a local form of Sicily.

Culot, N. et G. I. plt. 21, has three figs. all very good, strigilis, a small one with only a few white markings, latruncula and a very small aethiops.

Barrett describes the Variation as follows—" Exceedingly variable the more typical form varies in the ground colour from greyish-white, through various shades of grey, grey-brown, whitish-brown, and pale reddish brown, even pale olive-brown, or tinted with fulvous, and has the described markings in various dark shades, varying with the ground colour, or becoming at times even dark purple-red.

"In other cases the ground colour assumes dark brown and dark redbrown shades, the white wholly obliterated, or the white crescent above the anal angle alone remaining; and the wings are then marbled with more monotonous tones of brown and red-brown, the central band is

but little darker, or not so at all.

ab. terrea, Warr.-Seitz, l.c.

"But the most usual variation, and the most striking, which seems to accompany the type everywhere, except where it supersedes it, is deep black—wholly so—or else the thorax and ground colour of the forewings smoky black with a deep black central band; the stigmata often not visible.

"In all the forms the thorax follows in colour the darker portion of

the forewings; and the hindwings are darker or paler in unison.

Barrett records a specimen "large, of the typical colouring, with the markings grey-black, and of so bright a colour as almost to appear blue."

The names and forms to be considered are: strigilis, L., Sys. Nat. Xed. 516 (1758). strigilis, Clerck., Icones, plt. IX. 6 (1759). latruncula, Schiff., Verz. 89 (1775). Warr.-Seitz, Pal. Noct. III., plt. 40i. praeduncula, Schiff., l.c.; Warr.-Seitz, l.c. aerata, Esp., Schm. Abbild. IV(2). 466, plt. 146, f. 4-6 (1786 etc.); Warr.-Seitz, l.c. meretricula, Bork., Naturg, IV., 187 (1792). versicolor, Bork., l.c., 188 (1792). praeduncula, Haw., Lep. Brit. 213 (1806-10). latruncula, Haw., l.c. 214 (1806-10). aethiops, Haw., l.c. 215 (1806-10); Warr.-Seitz, l.c. suffuruncula, Frr., N. Beitr. V. 148, plt. 471 (1845). ?rubeuncula, Ramb. Donz., Ann. Soc. ent Fr. 430, plt. 12, 3-4 (1838).invisa, Walk., Cat. Noct. B.M. X., 259 (1856). ab. virgata, Tutt, Brit. Noct. I., 99 (1891); Warr. Seitz, l.c. ab. nigro-rufa, Tutt, l.c. ab. rufa, Tutt, l.c. ab. unicolor, Tutt, l.c.; Warr.-Seitz, l.c. ab. fasciata, Tutt, l.c.; Warr.-Seitz, l.c. ab. amoena, Krul., Soc. Ent. XXIII., 11 (1908). ab. intermedia, Horm., ; Warr.-Seitz, l.c. ab. suffumata, Warr.-Seitz, Pal. Noct. III., 172, plt. 40 k, i (1911).

ab. fasciata, Lenz., Oesth. Sudbay. II(2)., 269 (1927), plt. XIV. 19. Tutt treats of praeduncula which is strigilis, L.; ashy grey ground with reddish grey outer fascia, suffuruncula; ditto with reddish median band, virgata (both latruncula forms); ground reddish-grey or -brown with whitish or whitish grey outer fascia, strigilis, Clk. (a latruncula

form); ditto with pale reddish outer fascia, aerata (a latruncula form); ditto unicolorous, latrucula, Haw.; ground blackish or reddish-brown with whitish outer fascia, nigro-rufa (a strigilis form); ditto with red outer fascia, rufa, (a latruncula form); ditto unicolorous, unicolor (a latruncula form); ground black with white outer fascia, fasciata (a strigilis form); ditto unicolorous, aethiops (a strigilis form deep black, a latruncula form a paler slightly brown black).

The allocation of these forms and names between the two species is a difficult matter and quite open to criticism. The attempt is below.

Miana strigilis, L. (1758).

praeduncula, Schiff. (1775): Haw. (1806-10).

versicolor, Bork. (1792).

ab. aethiops, Haw. (1806-10) very black form.

ab. nigro-rufa, Tutt (1891).

ab. fasciata, Tutt (1891).

r. amoena, Krul. (1908).

ab. suffumata, Warr.-Seitz (1911). ab. terrea, Warr.-Seitz (1911).

ab. fasciata, Lenz. (1927) = fasciata, Tutt.

versicolor, Bork., Natury. IV., 188 (1792).

ORIG. DESCRIP.—"This Noctua has the size and appearance of strigilis. The forewings have a reddish-brown ground colour which is mixed with blackish brown chequered with whitish markings. At the base there is a trace of a whitish transverse line, then follows a whiter transparent streak. Next following there are the usual stigmata of which the orbicular is first, the reniform beyond, both of these are white edged, and below the orbicular there is a small claviform stigma of similar character. Beyond these stigmata is a white transverse band, in which blackish hairlike projections extend from the ground. The fringes are chequered white and black. The costa is black spotted and towards the apex of the wing white dotted. The hindwings are brown-grey; darker scaled on the outer margin."

This appears to be none other than the usual *strigilis*: Werneburg, *l.c.* is of this opinion. Bork, refers to Esper's plt. 146, fig. 3, labelled

strigilis var.

ab. amoena, Krul., Soc. Ent. XXIII. 11 (1908).

ORIG. DESCRIP.—"The whitish colour in the marginal area of the forewings has a distinctly greenish tone." Very scarce. Eastern Russia (Wiatka and Kasan).

ab. terrea, Warr.-Seitz, Pal. Noct. III. 172 (1911).

Fig.—l.c. plt. 40k.

ORIG. DESCRIP.—" A dull grey unicolorous form, with the lines, the outlines of stigmata, and the teeth of outer line finely black." Tring.

ab. suffumata, Warr.-Seitz, Pal. Noct. III. 172 (1911).

Fig.—l.c. plt. 40i.

ORIG. DESCRIP.—" Has the white areas of fasciata, Tutt, still farther reduced."

ab. fasciata, Lenz., Osth. Schm. Sudbay. II. (2), 269 (1927). Fig. —l.c. plt. XIV. 19. Orig. Descrip.—" Suffused to the white marginal area."

[Miana strigilis, Clrk. (1759).]?
latruncula, Schiff. (1775).
aerata, Esp. (1786).
meretricula, Bork. (1792).
ab. aethiops, Haw. (1806-10), paler form.
latruncula, Haw. (1806-10), var. a.
ab. suffuruncula, Tr. (1816-25).
ab. rubeuncula, Ramb. (1838).
r. invisa, Walk. (1856).
ab. virgata, Tutt (1891).
ab. unicolor, Tutt (1891), = latruncula, Haw. var. \(\beta\).
ab. rufa, Tutt (1891).
ab. intermedia, Hormuz., teste Splr.

meretricula, Bork., Naturg. IV. 187 (1792).

ORIG. DESCRIP.—"It is somewhat smaller than strigilis. which it resembles in shape and also much in marking. The ground colour of the forewing is brown and somewhat suffused with red-yellow scaling. The usual spots (stigmata) are yellow with brownish centres. Before these are a few yellowish wavy lines, and beyond them a yellow somewhat obsolete band, in which five or six black streaks run over into the brown area to the middle. Inside the fringes lies a yellow line; and the fringes are yellowish and black spotted. The hindwings are ashy-grey with yellow margin." This seems to indicate a latruncula form.

Werneburg, Beitr. II. 171, says this is latruncula and notes that Bork. himself in the Rhien. Mag. subsequently explained that this was a variety of latruncula.

ab. suffurucula, Treit. Schm. Eur. V(2). 97 (1816-25).

Tutt gave Freyer plt. 471 as the original of *suffuruncula*. This is not so as Freyer gives a reference to Treit.

Figs.—Freyer. Neu. Beit. II. plt. 142, 471. Freyer says his first

figure was from a not quite fresh example.

ORIG. DESCRIP.—" The forewings have three distinct areas, of which the first near the base and particularly the third are wide. These two are a shiny and near the second area a more silvery, and towards the base and fringes of a more coppery suffusion. The first area extends to the orbicular. A black streak lies towards the costa which ends at the orbicular. Then follows the stigma itself, and a longish, black streak, emphasised with silver and coppery colour. Under it lies a strong black square in place of the claviform. Beyond the orbicular and claviform the third area begins which contains the reniform which is wholly filled with silvery powdering. The waved line contains fine black dots and is coppery coloured. The fringes are dark brown and double edged." Vienna (Frr.).

rubeuncula, Ramb., Ann. Fr. (1838), 430-1. Fig.—l.c. plt. XII. f. 3-4.

ORIG. DESCRIP.—" Like latruncula but smaller. It is a brick-red, while that is black brown. The forewings have a brick-red ground lighter transverse sinuous wavy lines. The most notable is the third, which, before reaching the inner margin, takes the form of a white crescent of which the points are turned to the outer margin. On the inside of this is seen a squared space of a red brown; the stigmata are scarcely apparent; they are paler than the ground upon which they rest; the fringe is pale reddish streaked with brown.

"The hindwings are blackish with the fringes of a reddish white."

Pyrénées Orientales.

The inner half length of the 2nd line is well marked by white in the figure.

I note that Bdv. and Dup., attributes rubeuncula to Donzel and not

to Rambur [Ind. Meth. no. 901 (1840) and Cat. 126 (1844)]

Guenée describes aethiops. "The brown colour has become blackish and has invaded almost the entire wings: the subterminal space remains, however, just a little lighter, with a trace of a little ferruginous before the subterminal line. The other lines are almost entirely lost in the colour of the ground." Hb.-Gey. 776. Haworth's var. a. "totus niger" would be the ab. aethiops of strigilis.

race invisa, Walk. X. 259 (1856).

ORIG. DESCRIP,—"Pallide fusca: thorax fasciis obscurioribus cristaque postica nigricante; abdomen cinereum, cristatum; alae anticae gutta basali nigricante, lineis tranversis undulatis pallidis fusco marginatis, fascia cervina exteriore punctisque marginalibus obscure fuscis: posticae cinereae, ciliis testaceis interlineatis."

"Pale brown. Thorax with darker bands, and with a blackish hind crest. Abdomen cinereous, crested. Forewings with a blackish discal dot near the base, with transverse undulating pale dark brown bordered lines, with a fawn coloured exterior band and with dark brown marginal points. Hind wings cinereous, with testaceous interlined ciliae." Turkestan.

Miana, Steph. (1829) Stdgr., Tutt, Barrett, Splr., South. [Hadena, Schrnk. (1802) Meyr., H.-S.,: Oligia, Hb. (1822) Hamp. Warr.-Stz.: Apamea, Ochs. (1816-25)] fasciuncula, Haw. (1806-10).

This species has been so confused on the continent with strigilislatruncula that it is difficult to trace its history. Speyer, however, Stett. e. Zt. 126 (1867), with English examples before him considers that the British judgment is correct, less on account of the differences of colour and marking than in the shape of the wings, the straighter costa, less concave beyond the middle, the apex more produced and sharper, the border area, the narrowness of the median area on the inner margin, etc. H.-S. even put fasciuncula as a var. of latruncula.

Tutt remarked in 1891 that "This species (fasciuncula) which is generally treated as a variety of M. strigilis by the Continental authors,* is so exactly like that species in shape and markings, that, besides

^{*} Stdgr. Cat. Hed. (1871) treated fasciuncula as a species.

colour there appears to be no distinguishing mark in the image state by which it can be separated." [Brit. Noct. I. 102.]

Pierce in Genitalia of the Noctuidae, p. 33, figs. on plt. XIII., gives

the following definite differences :-

Strigilis. (1) Lobe of the anal angle of the cucullus thickly clothed with spines. (2) Clavus peaked, bulbed at the base, and clothed with short hairs. (3) Unous narrow waist, diamond pointed. (4) Juxta without side spines. (5) Ampulla rounded.

Fasciuncula. (1) LOBE of the anal angle of the cucullus thinly clothed with spines. (2) Clavus peaked and clothed with short hair. (3) Uncus broad without waist and pointed. (4) Juxta two arms surmounted with a bunch of spines on each. (5) Ampulla stout and

These differences are well shown on the plate.

In addition the terminal portion of the valve is produced in a "bird's head" in profile but the beak portion is still longer than in strigilis, and quite distinctive (teste Dr. Cockayne in lit.).

Tutt Brit. Noct. I. 101 (1891): Barr. Lep. Brit. Is. V. 15, plt. 186 (1899): Stdgr. Cat. IIIed. 165 (1901): Splr. Schm. Eur. I. 181. plt. 41 (1905): South Moths. B. I. I. 275. plt. 134 (1907): Hamp. Lep. Phal. VII. 377 (1908): Warr.-Seitz. Pal. Noct. III. 172. plt. 40k (1911): Culot Noct. et. G. I(1). 122. plt. XXII. 1-2 (1909-13).

Figure 550b of Ernst. and Engram. Pap. d'Eur. VII. (1792) is

that of a fasciuncula form possibly Donzel's rubeuncula.

Hubner's erratricula 537 does not belong here. The central fascia unites it undoubtedly with bicoloria. There are no traces of the white characters on the inner margin. Warr. in Seitz place it to bicoloria.

Wood, Ind. plt. 13. figs. 279-280, figures two forms, the former named rufuncula, reniform red not so red as the typical and with the fascia "Plain red minor," only showing on inner margin and the latter a typical form. The fig. 279 of Wood is a fasciuncula form undoubtedly and not the rufuncula of Haw. and Steph. Haworth's description of "strigis duabus rectis medio" undoubtedly refers to bicoloria. Fig. 279 has the med. fascia identical with that of the normal fasc. albeit somewhat wider on the inner margin.

H.-S's. figures are all three much like erratricula of Rambur but of normal size; all are characterised by the central area (fascia) being darker on the inner margin and contracted to half its width above and

bordered there by a conspicuous curve of white.

Spuler's figure is a very red brown colour, plt. 40, f. 8.

Warr.-Seitz, l.c. plt. 40k figures the grey and the red forms.

Culot, l.c. I(1). plt. 22 figures a typical form with an intermediate without very suppressed red colouring.

Guenée treats erratricula, Hb. nec Frr., as a species and states the essential characteristics as a ground colour of grey-violet, with the narrow median area of a decided black.

He describes a form of it (A) much mixed with reddish, the median area being of an agatha red. Thorax of a decided red with the black line of the collar very feeble.

Of the Variation Barrett says—"There is a constantly recurrent variety of the male, often common, which bears a far greater resem-

blance to the female—of a pale brownish-drab or yellow-brown, clouded with dull umbreous, and having the central band of a very soft umbreous, the markings normal except that the white edges to the transverse lines are less distinct, and the stigmata sometimes dusky white. Intermediates occur much more rarely. In all the colour of the thorax follows that of the central band of the forewings. In the North of Ireland and in Scotland the red forms are sometimes brighter red and the drab-brown rather darker, while some take a smoky tinge."

Barrett records a specimen having "the central band of a rich purple-red, with shading of the same on both base and apex of the

wings."

He also records a specimen "Entirely suffused with golden-yellow, through which the darker markings are perceptible."

The names and forms to be considered arefasciuncula, Haw. Lep. Brit. 215-16 (1806-10).

ab. rubeuncula, Donz. Ann. Soc. ent. Fr. 430. plt. XII. 3-4 (1838).

ab. erratricula, Rambr. Cat. Sys. Lep. And. plt. XVI. 1-2 (1858).

ab. cana, Stdgr. Cat. Hed. 102 (1871) [Haw. Lep. Brit. 216 (1806-10)].

ab. pallida, Tutt Brit. Noct. I. 101.

ab. extrema, Tutt l.c.

ab. suffusa, Tutt l.c.

ab. brnnneata, Warr.-Seitz. Pal. Noct. III. 172. plt. 40k (1911) [Hamp. Lep. Phal. VII. 377 (1908)].

ab. grandis, n. ab.

Tutt dealt with (1) fasciuncula typical; (2) rubeuncula, Frr. (not of Donz.) almost unicolorous, less red, band not developed; (3) cana, Stdgr. Haworth's var. B. the ground pale, with distinct fascia (red or dark fuscous); (4) pallida pale all over, fascia only on inner margin; (5) (pallida) extrema pale, entire absence of fascia; (6) suffusa dark greyish black with obsolescence of markings.

Tutt gives ab. rubeuncula as of Freyer (1845) whereas it should have been of Donzel (1838) as Freyer states. Tutt's description of the figure is wrong from my copy of Freyer. The figure is not "almost unicolorous." The usual markings of fasciuncula are quite apparent

and the arrangement of markings well defined.

Freyer, N. Beitr., V. 143 (1845), considers this, as did Donzel, a true species, whereas Bdv., Ind. Meth. (1840), placed it as a form of latruncula. No doubt this last opinion was in accord with the generally received continental view that fasciuncula was a form of strigilis.

H.-S. treats rubeuncula as a species only separable from latruncula with difficulty by the outer transverse line being cut through or not by the black veins, the appearance of the stigmata as lighter spots without sharp dark margins, the colour either clear cinnamon red (both sexes) or pale ochre-yellow at the base, in area 2 and beyond the elbowed line most red.

Warr.-Seitz. gives rubeuncula, Donz. and erratricula, Hb. and suffuruncula, Tr. as synonyms of literosa.

ab. rubeuncula, Donz. Ann. Soc. ent. France. VII. p. 429 (1838).

Fig.—l.c. plt. 12.

ORIG. DESCRIP.—"It has the appearance of latruncula, but is smaller. It is of a brick red, while that is a blackish brown. The fore-wings are a brick red ground with the sinuous transverse lines lighter. The most notable is the third, which before reaching the inner margin takes the form of a white cresent of which the points are directed to the outer margin. Within this crescent one sees a small square space of a red brown. The stigmata are obsolescent; they are paler than the ground on which they stand. The fringe is pale reddish cut into by brown. The lower-wings are blackish with the fringes of a reddishwhite. The female is of a paler tint, tending to soiled yellow; the lines are better indicated. Some males are the colour of the females." Mont-Louis. Pyrenées Orientales.

ab. grandis, n. ab.

Fig.—Ramb. l.c., plt. XVI. 1-2 (erratricula, Hb. ? error).

Orig. Descrip.—No letterpress.

Ramber, Cat. Sys. Lep. And. plt. XVI. f. 1-2 (1858) figures an insect under the name erratricula, Hb.? A careful comparison of the

figures show complete dissimilarity. There is no letterpress.

Hübner's fig. 487, erratricula is certainly a bad figure to represent any form of fasciuncula with which I am acquainted. It is smaller than Rambur's figure and the markings are not comparable, all being more or less regularly transverse and the general colour is not the beautiful red of fasciuncula, of which Rambur's figure certainly partakes. Warr.-Seitz. places it to literosa and I think rightly so, and Rambur's figures they place to fasciuncula.

In this case Rambur's fig. is without a name and as it is nearly

twice the size of typical fasciuncula it might be called grandis.

ab. brunneata, Warr.-Seitz. Pal. Noct. III. 172 (1911) [Hamp. Lep. Phal. VII. 378 (1908)].

ORIG. DESCRIP.—Hamp. Ab. 1. "Darker brown," Scotland.

Warr.-Seitz. "Scotch form browner, especially the lower half of median area."

ab. (ssp.) albiluna, Kozhants. Jahr. Martian. Minussinsk. VI. 76

(1929).

ORIG. DESCRIP.—"This was placed to the species Oligia leuconephra, Hamps. The determination of it as that species arose from an error since leuconephra does not belong to the genus Oligia. But the species which we included under the name leuconephra is a true Oligia which obviously possessed the habitus and the marking of O. fasciuncula. The distinction from the typical form consists only in the golden reflection from the brown forewings and the clear white half moonshaped spot in place of the indefinite reniform stigma."

Miana, Steph. (1829) Gn. New. Barrett, Stdgr. Splr. Cul. [Hadena, Schrnk. (1802), Meyr.: Apamea, Tr. (1816-25). Bdv.: Oligia, Hb. (1822) Hamp., Warr.-S.] bicoloria, Vill. (1789) = furuncula, Schiff. (1775).

Tutt took Villar's name for this species viz. bicoloria, Linn. Entomologia, II. 288 (1789), which name Bork. used Schm. IV. 190 (1792). Treit. Schm. Eur. V(2). 94 (1825), discusses the name and points out the agreement of Hübner's fig. 545, the specimens in Schiffermüller's collection, and the German description in the Verz., p. 89, 1775, that furuncula is the prior name for bicoloria, Vill.

Hüb. Text-Noct., 184 (1805-18) gives bicoloria, Bork. and meretricula,

Bork. as synonyms of furuncula, Schiff.

Villars gives a reference for bicoloria to "Entomologia Parisisnis, 194," which I have failed to trace. It would appear to refer to Fourcroy or to Geoffroy, but I fail to find the name in either of these books.

furuncula, Schiff. Verz. 89 (1775).

ORIG. DESCRIP.—" Small Noctua, has a transverse band on the dependent very dusky forewings, which narrows inwards, is least on the inner margin and is margined with a white wavy contour line. There stands a few tufts of hair on the body. Braune Weissstreifigte Eule." It is classified with latruncula, praeduncula (strigilis), etc.

There seems great uncertainty among earlier authors what is the colour and marking of the earliest named form, i.e., of furuncula, Schiff. If we may depend on the remarks of Treit., l.c., 94, this fig. 545 is of the typical form, which Hb. describes, Text p. 184, as "reddish brown, the outer half of the wings pale in colour, with whitish reniform and waved line, the body and abdomen grey. Syn, furuncula, Treit., bicoloria, Bork. and meretricula, Bork."

Tutt Brit. Noct. I. 103 (1891): Barrett Lep. Br. Is. V. 20, plt. 187 (1899): Stdgr. Cat. IIIed., 165 (1901): Splr. Schm. Eur. I. 181, plt. 41 (1905): South M. Br. Is. I. 277, plt. 134 (1907): Hamp. Lep. Phal. VII. 393 (1908): Warr-Seitz. Pal. Lep. Noct. III. 173, plt. 41 (1911): Culot N. et G. I(1). 122, plt. 22 (1909-18).

Esper's fig. aerata plt. 146, 5, which is sometimes referred to this

species is undoubtedly a strigilis form.

The figures of Ernst. and Engr. Pap. d'Eur. VIII. are very mixed and difficult to elucidate. Werneburg says 548a small and light clay yellow furuncula; 548b-e, he also calls furuncula. Probably correctly except that b is exceptionally large for this species, 549a-c he calls furuncula. I would only call a this species. 550f he calls strigilis, but I should certainly agree with Guenée and call it furuncula.

Hübner's Noct. 96 (1808) shows the characteristic transverse line of vinctuncula very clearly. 545 (1808-18) has a uniform strongly dark mahogany brown base with ochreous brown ground. Tutt calls this the typical figure of furuncula, and thus does not agree with Gn. who gives Ernst. and Engr. fig. 550f which has no shade of reddish or brown in it. Hübner's fig. therefore does not represent the bicoloria as described by Villars. But Borkhausen IV. 190, however, describes the

basal half as either brighter or darker red-brown. Hence Gn. has not indicated the typical furuncula but the bicoloria form. Goetze calls it the "white streaked brown." Ent. Beitr. III(3). 222.

Dup. *Hist. Nat.* VI. plt. CI. f. 3 is of a very dark form of two main shades of dark reddish-grey, the basal half being of a deep brown

(VII. 1).

Wood. Index. figs. 277 and 278 plt. 13, are humeralis and terminalis. He does not figure the very light form with which one is so familar on the sea coast, sandhills, etc. His figure 279 labelled rufuncula is not this species but a fasciuncula form.

South. M. Br. Is. I. plt. 134. gives five figures not one of which is typical furuncula as depicted by Hb. Fig. 3, is probably the bicoloria, Villars, ground colour greyish fuscous with outer half paler than basal

half.

Warr.-Seitz figures bicoloria, Vill. plt. 40l, furuncula, Hb. plt. 40l, rufuncula, Haw. 2 figs. 40l, terminalis, Haw. plt. 40l, vinctuncula, Hb. plt. 41a, unicolor, Warr.-S. plt. 41a, pallidior, Stdgr. plt. 40l, reticulata, Tutt. plt. 40l, brunneo-reticulata, Tutt. plt. 40l, longistriata, Warr. S. plt. 40l. Yet none of the really pale forms are figured, all are what I should call dominantly dark.

Culot figures, l.c. plt. XXII. f.8. bicoloria; f.4. furuncula; f.5. insulicola; and f.6. vinctuncula; as usual all are quite excellent figures.

Of the Variation Barrett says.—"A form which instead of having the colours of the forewings equally divided [as in typically marked forms] has them completely marbled with some shade of brown or reddish-brown, is in many districts even more plentiful, and in this the perpendicular line is usually obliterated. Intermediate forms retaining the division, but having the outer portion almost any shade of brown paler than the inner are not infrequent."

"In some parts of the South Coast and especially in the Isle of Wight, the brown of the basal half is invaded with white, so as in some instances to leave a darker central band and even to furnish its lower half with a dark brown or black bar, while in others the orbicular stigma and an oblique blotch below it become white; in all these the white outside the perpendicular line has a chalky tint. In these localities the female in some instances has similarly divided colouring.

"In Berkshire and elsewhere inland the basal half is not seldom of a rich purple-red or purple-brown, and the hind marginal cloud

similar or darker."

Barrett records a form in great abundance from some parts of the Irish coast, "having the forewings unicolorous yellowish-drab, varying but little darker or paler." "This form stands broadly out from the rest, but language altogether fails to express the intermingling of all these variations."

Barrett adds "Various names have been given to these forms, in the first place under the impression that they formed distinct species, more recently as varieties:—from our great knowledge of the intermediates, these have lost all definite meaning and seem to be of little value."

The Names and Forms to be considered are:—
furuncula, Schiff. Verz. 89 (1775).
f. bicoloria, Vill. Linn. Ent. 288 (1789).

ab. terminalis, Haw. Lep. Brit. 215 (1806-10).

ab. rufuncula, Haw. l.c.

ab. humeralis, Haw. l.c. var. γ.

ab. vinctuncula, Hb., Noct. 96 (1802).

furuncula, Hb., l.c. 545 (1808-18) = furuncula, Schiff.

furuncula, Tr., Schm. V(2). 92 (1816-25).

ab. pulmonariae, Dup., Hist. Nat. VI. 47 (1826) plt. 75. erratricula, Freyer, Neu. Beitr. II. 81, plt. 142, 3 (1836).

furuncula, H.-S., Neu. Schm. p. 4, figs. 19, 22, 23 (1856) = insulicola, Stdgr.

subsp. insulicola, Stdgr., Cat. Hed. 103 (1871).

subsp. pallidior, Stdgr. Stett. e. Zt. XLIII. 42 (1882).

ab. pallida, Tutt, Brit. N. I. 105 (1891).

ab. albicans, Tutt, l.c.

ab. reticulata, Tutt, l.c.

ab. fusca-reticulata, Tutt, l.c.

ab. brunnea-reticulata, Tutt l.c.

ab. rufa-reticulata, Tutt l.c.

ab. grisea-reticulata, Tutt l.c.

ab. semicretacea, Alph. Mem. Rom. IX. 29 (1897).

ab. albimacula, Splr. Schm. Eur. I. 181. plt. 41 (1905).
 ab. unicolor, Warr.-Seitz. Pal. Noct. III. 173. plt. 41a (1911).

ab. longistriata, Warr.-Seitz. l.c.

Tutt dealt with pallida, whitish grey of two shades, the basal half slightly darker: subsp. insulica the mottled whitish grey form; the unicolorous whitish grey, albicans; bicoloria the grey fuscous with outer half paler = humeralis, Haw.; reticulata, the mottled fuscous grey with distinct markings; humeralis, var. y, Haw., the unicolorous fuscous grey; the reddish-or ochreous-brown form, furuncula, Hb. (Haw.?); the mottled ochreous- or reddish-brown, brunnea-reticulata; the unicolorous ochreous- or reddish-brown, terminalis, Haw. a and b.; pale reddish ochreous with outer half pale reddish grey, pulmonariae; the mottled pale reddish ochreous, ruja-reticulata; the unicolorous pale reddish-ochreous, rufuncula, Haw.; vinctuncula, the narrow banded (black) form; and in the Appendix Vol. IV. pallidior, a paler form with basal half rufous, terminal half whitish, hindwings white. also refers to fusca-reticulata and grisea-reticulata, neither of which he otherwise mentions. Probably the former refers to reticulata above and the latter insulicola above.

Haworth evidently did not consider his rufuncula related closely to his humeralis and terminalis as he separated them by his fasciuncula, and if Wood's fig. 279 of rufuncula be correct it certainly is not a form of furuncula as the outer limit of the fascia of fasciuncula form, outside the reniform, is double curved and not straight. The colour also is the red of the latter and not the red with pubescent white surface of the former. Stephens only had one poor example.

Freyer, Neu Beitr. II. p. 81. plt. 142. 3 (1836) erratricula does not belong here nor is it the erratricula, Hb. It has been put here by

some authors.

White form, as figured in Ernst and Engr. VIII. fig. 550 f. This figure

is too large and also too clearly and brightly marked and has a much better appearance for *strigilis*. Werneburg considers it to be *strigilis*. Guenée says:—typical form: half brown, half white, (i.e. bicoloria form).

terminalis, A: white half replaced (=548 d. e.) with division

line still distinct by a. brown, b. reddish.

rufuncula, B: whole wing uniform tint, one sees only the division line, the basal line and black traces in the terminal space.

vinctuncula, A: whole wing uniform tint, line very pronounced

black.

pulmonariae, C: ground yellow-ochre, stigmata clear, obsolescent central line = Engr. 548a b.

pulmonariae, D: grey black, extra basal area brown mixed with

yellow to base.

Stdgr. Cat. Hed., 103, gives var. et ab. insulicola with reference to H.-S. Neu Schm. 4, figs. 19, 22, 23, (al. ant., griseis, albido, nigroque, strigulosis) thus naming the form of furuncula figured by H.-S.

Newman, Brit. Moths, 309 (1869) points out that Haworth's humeralis, terminalis, and rufuncula are the 3 chief forms of furuncula,

and he (Newman) figures all three rather crudely.

Tutt quotes Stdgr. (IIed.) for the typical form "ab. ant. usque ad medium fuscis." (iisque is a printer's error, B. N. I. p. 103) as describing the typical form. In IIIed. Stdgr. adds "deinde albicantibus."

Tutt says 4 ground colours, white, fuscous grey, pale reddish, dark reddish, and of each. (1) unicolorous (2) mottled with transverse whitish lines (3) basal half dark, outer pale grey or white. a. unicolorous base. b. mottled base.

Stdgr., Cat. IIIed. 165, lists semicretacea, Alph. as his pallidior (dilutior, al. ant. dimidio basali rufescenti, dimid. exter. subalbido, al. post. sordide albidis).

He lists the rufuncula, Gn. as the vinctuncula, Hb. (ut rufuncula

sed al. ant. fasci media tenui nigra; ab. rarissima).

He says that the furuncula, H.-S. Neu Schm. is the same as his insulicola (alis ant, griseis, albido nigroque strigulosis).

He says that the *erratricula*, Frr. is the same as the *rufuncula*, Haw. (alis ant. fere unicoloribus rufescenti-griseis) see ante.

He lists terminalis, Haw. as the furuncula, Hb. 545.

He omits all reference to the pulmonariae, Dup.

Splr. takes bicoloria, Vill. as the type, where the basal half of the forewing is brown and the outer-marginal half whitish. If the base be very pale it is ab. pallida. If the outer half is reddish or brownish, it is ab. furuncula. When the forewings are unicolorous red-grey it is ab. rufuncula, and with white reniform is ab. albimacula. If similarly coloured with narrower black brown transverse bands it is the rare form ab. vinctuncula. The var. (race) insulicola has greyish forewings, which are marked by whitish and brown-grey, and come from Helgoland. In sandy steppe-like areas occurs rufuncula, with reddish base, lighter and whiter marginal half of forewing and dusky whitish hindwings, which form is paler further east as var. pallidior (Schm. Eur., I. 181-2).

Hamp., l.c., adopts furuncula, Schiff., he treats erratricula, Frr. (nec. Hb.) as synonymous as well as suffuruncula, Bdv., Ind. 116.

Warr.-Seitz uses bicoloria, Vill., and states that "typical bicoloria

has the outer area whitish or grey with a rufous tinge." Of furuncula, Hb., he says, "the outer half is reddish-brown approaching the colour of the basal half," with which his fig. plt. 40l, somewhat agrees, but does not agree with Hübner's fig. 545, which is remarkably rich in colour.

He puts humeralis, Haw., as a syn. of bicoloria; rufuncula, Haw. is the erratricula of Freyer, nec. Hb.; insulicola, Stdgr. is furuncula, H.-S. (nec. Hb.).

Dup. Hist. Nat. VI. 47, plt. 75, f. 3, has described and figured his form pulmonariae, in proximity with Caradrina in which he followed Ochs. Treit. Gn. Noct. V. 217, draws attention to the yellow-ochreous ground and the very slight separation into the two shade areas of the usual forms. He says that fig. 548 a, b, Engram. is the same, but the colours of this insect in my copy of the latter work are much too bright and b has the separation very well defined.

subsp. insulicola, Stdgr. Cat. IIed. 103 (1871).

H.-S. Nen Schmett. p. 4, 1856, writes the following note concerning

figs. 19, 22. 23 on his plate.

"I consider there is almost a specific difference from A. furuncula; it appears somewhat more slender, the colour not so reddish, but brownish yellow, the reniform more distinct, smaller, and whiter.

"One example as pale as fig. 23 has the basal half of the forewing and the marginal area beyond the waved line as dark as typical

furuncula."

From the Island of Norderney in numbers, where no ordinary furuncula occur.

These three figs. 19, 22, 23 may be described—

19 has a darker ground, more dark ochraceous, but the markings are quite distinct.

22 is very uniform grey, with suppressed markings just visible, the

most apparent being the submarginal.

23 has the upper $\frac{2}{3}$ of the f.w. very whitish and also a thin whitish inner margin. A darker chevron before the apex. The remaining $\frac{1}{3}$ being darker still, forming a long wedge from submarginal near inner

angle to the base in a blunt point.

Culot, N. et. G. I(1). 123 remarks, "The example which has served me as a copy was furnished by Stdgr. to the old collection of Pictet, forming now a part of the Museum of Geneva; thus one may assume that the determination is correct." However, there seems to me but little agreement with Stdgr's description, which reads thus, Alis ant, griseis albido nigroque strigutosis. In my opinion it belongs to the ab. rufuncula, Hw.

subsp. semicretacea, Alph., Mem. Rom. 1X. 29 (1897).

ORIG. Descrip.—"Var major, pagina postica anticarum albidiore. $\mathcal{J}=26$ mm. A single \mathcal{J} larger than the European type, with the exterior half of the forewings whiter, appears sufficient to me to form a characteristic geographical race of bicoloria, Vill." Cent. Asia near Moudjik.

ab. albimacula, Splr., Schm. Eur. I. 181 (1905).

ORIG. DESCRIP.—"When the unicolorous red-grey form has a white reniform it is ab. albimacula."

ab. unicolor, Warr.-Seitz, Pal. Noct. III. 173 (1911). Fig.—l.c. plt. 41a.

ORIG. DESCRIP.—" Differs from vinctuncula, Hb. in being unicolorous fawn brown with a slightly darker band instead of the black band."

ab. longistriata, Warr.-Seitz Pal. Noct. III. 173 (1911). Fig. — l.c. plt. 40l.

ORIG. DESCRIP.—"In which a straight black streak runs along the submedian fold from base to termen; the ground colour is pale grey, suffused with rufous-brown except at base of costa and beyond the pale grey reniform stigma, the terminal area being paler rufous-brown; hindwings grey." Bilbao, Spain.

ADDENDA.

var. reisseri, Schawerda, Zeit. Oestr. Ent. Ver. XVII. 13 (1932). Figs.—Plt. III. 5, 6.

Orig. Descrip.—" The ground colour of the forewings is grey-The central area is dark brown, in the small examples almost The central area is margined both on the outside and inside by a white double line. The outer white double line is conspicuously scalloped on the inner margin in both specimens bow-The orbicular is clearly visible, with light margin. reniform large, distinctly white, and since it reaches a white larger costal marginal spot, appears conspicuously larger and whiter. Three very small white spots on the costa towards the apex. An indistinct whitish premarginal transverse line. Blackish marginal lunules. Light and dark chequered fringes on the forewing. The outer area between the light curved lines and the outer margin darker. near the white of the marking a lighter variegated tone. In the larger 3 there is a darker cell space on the hindwing very clearly defined. Thorax the colour of the forewing, along the abdomen more dark grey than the hindwing and the unicolorous underside." High Mountains of Corsica. Nearest to ab. reticulata, Tutt, and ab. brunneo-reticulata, Tutt.

ab minor, Cabeau, Lamb. XXXII. 82 (1932).

Orig. Descrip.—" Very small, 17mm., but in coloration as in ab. bicoloria, Vill. Framières."

ab. minuscula, Cabeau, l.c.

Orig. Descrip.—" Small as in ab. minor, but the coloration of ab. rufuncula, Haw. Framiéres."

Miana, Steph. (1829), Gn., Barr., Stdgr., Splr., Cul. [Hadena, Schrnk. (1802) Meyr.: Apamea, Ochs. (1816-25) Frr.: Oligia, Hb. (1822) Warr.-S., Hamp.] literosa, Haw. (1809).

Gn. Noct. V. 216, like many continental authors, says that literosa is the erratricula, Hb., but not of Freyer. His var. A "Of a rosy-grey, much suffused with reddish" may represent literosa. Warr.-Seitz gives this latter varietal status under the name subrosea. Hamp. Lep. Phal. VII. 389, treats erratricula, Hb. as synonymous.

Although Tutt does not refer to erratricula, Hb. under bicoloria = furuncula, under literosa he expresses the opinion that erratricula is a form of bicoloria, although on the continent literosa has always been included with it. I am in agreement with Tutt here for all the literosa I have seen and all those recorded have a peculiar rosy coloration which is unmistakable.

Reference to the figures of the genitalia of *literosa* and *furuncula* in Pierce Gen. Noct. plt. XIII. is quite convincing as to their specific distinctness. The text l.c., p. 32, 33 is rather measure and not

sufficiently comparative.

Tutt, Brit. Noct. I. 106 (1891): Barr. Lep. Br. Is. V. 8, plt 185, 2 (1899): Stdgr. Cat. IIIed. 164 (1901): Splr. Schm. Eur. I., 180, plt. 41 (1905): South Moths Br. Is. I. 276, plt. 134 (1907): Hamp. Lep. Phal. VII. 389 (1908): Warr.-S. Pal. Noct. III. 172, plt. 40k (1911): Culot N. and G. I(1). 121, plt. 21, f. 15 (1909-13).

Stephens has a good figure but somewhat larger than average examples. Ill. III. plt. 25, fig. 1 (1829).

Warr.-Seitz includes the erratricula of Hb. and the suffuruncula,

Tr. as synonyms.

He figures 3 and 2, typical markings but the rosy flush practically suppressed; constricta; subarcta with no red tints; subrosea, the whole forewing suffused rosy brown; and onychina, reduction of dark tints, the whole forewing creamy grey, a striking ab. Ab. subrosea is var. A of Guenée.

Culot N. et G. I(1). plt. 21, fig. 15 has a very good figure of the

typical form.

Oberthür (1918) treats literosa as the same as the erratricula, Hb. 537.

Barrett says of the Variation—"Very slightly variable in the general colour of the forewings, from purplish-red to purple-grey, and in the degree of silvery-grey clouding."

Barrett records a specimen which "has these wings entirely dark

purple, without any pale clouding; from Essex."

He also records another "strongly tinged with rusty-red and has

no pale clouding."

Tutt notes, "rather paler" specimens from Forres, Scotland, "variation in the width of the median band," "also its intensity," and the "development of the longitudinal — mark under the stigmata." "It is the most constant of all the British species of Miana."

The Names and Forms to be reviewed are:—
literosa, Haw. (1809) Lep. Br. 213.
erratricula, Hb. (1808-18) Noct. 537, Text 184.
ab. suffuruncula, Tr. (1816-25) Schm. V(2). 97.
ab. suffuruncula, (Frr.) (1825) Neu. Beitr. II. plt. 142, 4.
subsp. onychina, H.-S. (1856) Neu. Schm. 4, figs. 20-21.
race subarcta, Stdgr. (1897) Iris. X. 283, plt. IX. 14.
ab. constricta, Warr.-S. (1911) Pal. Noct. III. 172, plt. 40k.
ab. subrosea, Warr.-S. = Gn. (1911) l.c.
race powelli, Obthr. (1918) Lep. Comp. XVI., 135, plt. 496, f. 417.

Of erratricula Hübner, Text Noct. p. 184, says, "brownish red, grey shading; the wings dusky, marked with pale yellowish-brown centered stigmata." This cannot be literosa, which is "violet grey with a partial rosy brown flush" (Warr.-S.). Stdgr. also queries the identity, Cat. 165.

ab. ? suffuruncula, Tr. Schm. Eur. V(2). 97 (1816-25).

Fig.—Freyer. Neu. Beitr. II. plt. 142, f. 4.

ORIG. DESCRIP.—"Fresh specimens are very bright and shine with a mixture of silver and coppery colour on the forewings. This feature is sufficient to distinguish it from the other species, even if no other character is to be found.

"Head, neck and thorax grey with reddish and white hairs. The neck is darker edged, the thorax crested. The abdomen ashy coloured. The antennae clear brown, not toothed in the male. The feet grey,

white ringed.

"The forewings have three areas, of which the first at the base and especially the third are very wide. They are both very glossy, towards the second area more silvery, towards the base and fringes more suffused copper colour. The first area reaches up to the orbicular. Towards the costa there lies a black streak, which ends before the orbicular. Then follow the orbicular itself as a longish blacker marking filled in with silvery and coppery colour. Under it lies a strong black square in place of the claviform. Beyond the orbicular and reniform stigma the third area hegins; the reniform is wholly suffused with silvery. The waved band is fine, black points and finally there comes coppery colour. The fringes are double-edged dark-brown. The hindwings are uniform grey somewat darker towards the outer margin and strongly glossy. The fringes again are brighter."

Hamps., Lep. Phal. VII. 389, treats suffuruncula, Ochs. and Treit.

as well as erratricula, Hb. as synonyms of literosa.

Freyer, Nen. Beitr. 1I. 81, plt. 142, f. 4, figures the suffuruncula, Tr. from the actual specimen from which Treit. made his description many years before, Schm. V(2). 97. The figure wants the peculiar rosy colour of literosa and if that species, must be considered as a form of it. The band is certainly like that of typical literosa and not comparable with either erratricula or fasciuncula or bicoloria (furuncula). The example would not be a fresh specimen and therefore would not be "sehr schön und frangen mit einer silber—und kupferfarbigen Mischung auf den Vorderflügeln."

race onychiona, H.-S. Neu. Schm. 4 (1856).

Figs.—l.c., 20-21.

ORIG. DESCRIP.—"The more unicolorous the specimen is and the more indistinct all the marking is, the more sharp do the veins stand out, while in the darkest example they are resolved into small dots; the central area is always broader than in *erratricula*, the orbicular is more oblique and more produced, the black streak in cell 1b of the central area is always wanting."

"Compared with eratricula (sic): 23 examples which I have before me are quite different from that. There is wanting the bright cinnamon-brown suffusion, the ground colour is a pale red grey mixed with

shining grey, the latter colour being most apparent on the reniform and on the veins."

Hamp. Cat. I.ep. Ph. VII., 389 (1908) "Much paler; forewing grey white, the marking obsolescent."

Oberthür says, Lep. Comp. XVI. 135. "With wings unicolorous and of a uniform clear ochre tint. None of the ordinary spots or lines are present on the forewings above. Of a uniform clay or dust colour." Heligoland.

race subarcta, Stdgr. Iris. X. 283 (1897).

Fig.—l.c. plt. 9, f. 14.

Orig. Descrip.—" Herr J. Paulus sent me a tolerably fresh (only somewhat damaged) example, 28mm. in expanse, a 2 caught at light on June 11th at Jerusalem, to which a 3 sent much later by him measuring 25mm, belongs. I see now that both these insects can only be a local form of H. literosa, to which a tolerably perfect ? 30mm. in expanse caught in Sicily by Herr Kalchberg and one found by Haberhauer in mid August at Lepsa in N.W. Central Asia belong. I have described the last in the Stett. Ent. Zeit. 1882, p. 41, as "Literosa with very little reddish suffusion." Thus it is apparent, that these var. subarcta on the average are larger than literosa, A chief point of distinction from typical English and German literosa is the obsolescent nature of the reddish suffusion of the forewings, which in the Palestine specimen is quite absent. This absence of the reddish coloration mislead me especially to identify (compare) the large female from Palestine with the somewhat larger arcta, Led., and the equally large arctides, Stdgr., from the Amur area. From both these forms very similar to one another literasa is to be distinguished, and also from subarcta by the lighter almost markingless underside. There shows in the first two forms distinctly, broad, dark transverse lines particularly on the lighter hindwings which also bears a sharp, dark discal spot, while the almost white-grey underside of the wings of literosa is mostly not marked, or only on the hindwing bears a very obsolescent dark discal spot and traces of an obsolete transverse line. The v. subarcta differs from the confusedly tolerably variable Central-Asian literosa (unter eiander), moreover by no constant difference; the middle area of the forewing between the two transverse lines, is mostly wider and produced somewhat blacker or black margined, by which subarcta appears very like the arcta form."

Hamp, says, i.c. 389, "Larger; forewing not tinged with rufous."—

Sicily, Palestine, Ala Tau.

ab. constricta, Warr.-Seitz Pal. Noct. III. 173 (1911).

Fig.—l.c. plt. 40k.

ORIG. DESCRIP.—"Principally confined to the & &; the median area between the two lines is narrowed and much darker, especially in the two folds, and the red flush is less developed."

ab. subrosea, Warr. Seitz. Pal, Noct. III. 173 (1911).

Fig.—l.c. plt. 40k.

Orig. Descrip.—" The darker grey and fuscous tints may be reduced and the whole forewing suffused with rosy brown, the whole thorax also showing rufous." A common form in England.

The ab. A. of Gn. is this form (1925) Noct. V. 216 "of a rosy grey, much suffused with reddish."

race powellii, Obthr. Lep. Comp. XVI. 135 (1918).

Fig.—l.c. plt. 496, f. 4117.

Orig. Descrip.—"The Algerian race is more uniformly grey and the appearance more frail. Divested of all trace of red." Greyville.

"It is not exactly referable to the Sicilian subarcta, Stdgr."

The figure is larger than the average British races and the colour is quite distinctive dull orange apparent even through the markings. The stigmata are somewhat lighter. There is a transverse narrow dark band inside the orbicular, a similar but wider band between the orbicular and reniform which is curiously but clearly interrupted by the lighter claviform, also a slight dark chevron lies on the costa behind the apex. The hindwing has a dark marginal band of some width; the ground colour is not a shade lighter than on the forewing.

Phothedes, Led. (1857) New., Stdgr., Tutt, South. [Hadena, Schrnk. (1802) Meyr.: Apamea B. Treit. (1816-25), Bdv., Dup., H.-S., Evers.: Oligia, Hb. (1822), Warr.-S., Hamp.: Miana, Steph. (1829), Dbldy., Stain., Stdgr., Barr., Splr., Culot.] captiuncula, Tr. (1816-25).

Tutt Br. Noct. I. 107 (1891): Barr. Lep. Br. Is. V. 24, plt. 188 (1899): Stdgr. Cat. IIIed. 165 (1901): Splr. Schm. Eur. I. 182, plt. 51, 45 (1906): South Moths Br. Is. I. 277, plt. 134, figs. 17-18 (1907): Hamp. Lep. Phal. VII. 394 (1908): Warr.-Scitz. Pal. Noct. III. 174, plt. 41b (1911): Culot N. et G. I(1). 123, plt. 23, f. 7-9 (1909-18).

Dup. Hist. Nat. Noct. VII.(1), has a good fig. of the variegated continental form.

H.-S. Noct. II., figs. 173, 174, are very variegated forms of the purple-red continental suffused form.

Meyr. Hand. Ied. 136, places expolita as not differing from captinucula, and also refers it to Stain., possibly correctly in part.

Warr.-Seitz, l.c. plt. 41b, figures the typical form and expolita, Dbldy. In the typical figure the purple-red colour predominates, but in that of expolita it is completely absent.

Culot, N. & G. I(1). plt. XXII. figs. 7, 8, 9, gives 3 very good

figures of the variegated purple-red continental form.

The Forms and Names for consideration are:—captiuncula, Tr. (1825) Schm. V(2), 96.

subsp. expolita, Dbldy.-Stain. (1855), Stain. Ann. I. 41 (63).

ab. unica, Frr. (1858), Neu. Beitr. VII. 68, plt. 640.

subsp. tincta, Kane (1895), Ent. 165.

ab. captiunculoides, Hamp. [Strand] (1908-1915), Lep. Phal. VII. 394 [Arch. Nat. ges. LXXXI, 154. Abt. A. Heft. 11.]

ab. albosuffusana, Hamp. [Strand] (1908-1915) l.c.

Tutt dealt with (1) captiuncula the purple-red continental type, (2) the grey British form expolita.

Barrett says of the Variation—" Not very variable, but there is a tendency in the male to the brighter purple-red colour of the female; and in the West of Ireland this is accentuated, so that all the specimens from that district are of a much richer, brighter red colour.

He records an example from Durham which "has the reniform stigma distinct with white margins and a broadly white second line."

He also records another which "has a rich red central band and a white stripe on each side of it."

And of another he says "has the second line, not only broadly

white, but strongly angulated."

The Russian race described by Eversman, Noct. pt. IV. 41 (1856), has no purple-red and from the description more resembles the British dark grey form.

ab. unica, Frr. Neu. Beit. VII. p. 68 (1858).

Fig. -l.c. plt. 640, f. 1.

ORIG. DESCRIP.—"This striking little Lepidopteron stands nearest to N. latruncula. It is smaller and smoother than latruncula. Thorax and forewing black with purple-red suffusion. The stigmata are purple-red and fairly distinct. From the base runs a purple-red thin streak through the first paler scarcely visible band. Beyond the reniform lies a white narrow band toothed on the outer edge across the whole breadth of the wing up to the inner margin, which divides the forewing into two areas. To this white band succeeds a purple-red dark marbled area. The fringes are black grey. The abdomen and the hindwings as well as the whole underside is dark, black-brown."

The figure and description only agree in a general way. The detail is partly incorrect in either figure or description. More probably the figure wants the delicate detail of the description. Warr. Seitz, l.c. p.

174, treats unica, Frr., as of the type form.

subsp. tincta, Kane, Ent. 155 (1895).

Orig. Descrip.—"A richly coloured form found by Mr. Birchall. Forewings: basal third of a warm grey, somewhat mottled followed by a deep rose-coloured band reaching from costa to inner margin, bordered interiorly by a very sinuous festooned line of purple-brown, edged externally with grey, and exteriorly by one of similar colours, deeply elbowed towards the outer margin of the wing; the outer third of the wing is of a shining pink, with a dark ruddy patch along the costa, but not reaching to the apex, and a clear whitish suffusion along the lower and outer portion of the red central band, corresponding to the whitish patch shown in the same position in M. strigilis and M. fasciuncula. Hindwings of a sooty-brown, shot with a ruddy reflection. All fringes of a dirty grey. Thorax of a dingy brown; abdomen paler." Local but plentiful. Ardrahan, Ireland.

Hamp., Cat. Lep. Ph. VII. 395 (1908), "Forewing with the basal area grey, the medial area deep pink, the terminal area pale glossy

pink."-Ireland.

ab. captiunculoides, Strand, Hamp. Cat. Lep. Ph. VII. 394 (1908-1915).

Orig. Descrip.—" Forewing with the postmedial area rufous with-

out white beyond the postmedial line."

ab. albosuffusana, Strand, Hamp. Cat. Lep. Ph. VII. 395 (1908-1915).

Orig. Descrip.—" Forewing with the ante- and postmedial areas largely suffused with white."

Celaena, Steph. 1829: Gn., Stdgr., Barrett, Splr., South, Hamp., Cul. [Hadena, Schrnk. (1802), Meyr.: Apamea, Ochs. and Tr. (1816-25), Curt., Frr.: Oligia, Hb. (1822), Hamp., Warr.-S., Matsu.: Gortyna, Hb. (1822), Evers.: Luperina, Bdv. (1829), Hoffm.: Neuria, Gn. (1841), H.S.] haworthii, Curt., 1829.*

Tutt, B.N. I. 107 (1891): Barrett, Lep. B.I. V. 1, plt. 185 (1899): Stdgr. Cat. IIIed. 169 (1901): Splr. Schm. Eur. I. 186, plt. 39 (1905): South Moths Br. Is. I. 269, plt. 128 (1907): Hamps. Lep. Ph. VII. 195 (1908): Warr.-Seitz. Pal. Noct. III. 174, plt. 41b (1911): Culot, N. et G. I. (1), 142, plt. 26 (1909-13).

Steph. Cat. II. 87, gives Esp. Abbild. IV. plt. 166, f. 7, for lancea. However there is no fig. 7 to plt. 166, nor can I trace the name in

Werneberg's Beitr.

Eversmann in Bull. Mosc. p. 550 (1842) and in Fn. Volg. p. 72 (1846) described a species morio, which in his subsequent Noctuites Bull. Cazan, pt. II. p. 395 (1855) he identified with typical haworthii, and also with Freyer's erupta.

Wood's figures, Ind. 283, is fairly typical, but not variegated as much as the usually occurring type; 284 is lancea of a lighter brown with light hindwings; 285 is hibernica a darker, richer brown; both the last are more uniform in coloration with suppression of the

orbicular.

Freyer's fig. of morio, N. Beitr. V. 388, 1, is a uniformly red brown with white-ringed reniform stigma from which a few white lines run outwards, a white submarginal line, and marginal white dots. This is much like one of the figures of Graslin, Ann. Soc. ent. Fr. (1848). It is of good size. His fig. 472, l.c. erupta, has a similar reniform but white inside, a white orbicular, a white inner marginal line and numerous white transverse lines along the submarginal area. This is smaller. Neither is like typical haworthii.

H.-S. says that the *morio* of Freyer plt. 388, 1, is unrecognisable. In his Synonymic Catalog-Index, he cites *lyncea*, Steph. (recte *lancea*)

but omits it in the text.

Graslin, Ann. Soc. ent. Fr., p. 58 (1848) gives 4 good figures. 3, no veins white; 5, veins in submargin only white; 4, veins generally white but not continuous; 6, veining white continuously.

Tutt says morio runs Freyer's erupta closely (B.N. 109).

H.-S., Sys. Bearb. figs. 467-8, has two excellent figures of the

typical form, 3 and 2.

Fig. 14 in Humph. and Westw. is an average well marked example of the typical form and of good size. None of the marking in either fig. is white, all are rich yellow.

^{*} Hampson gives the weird spelling havorthi.

The fig. of tripuncta in H. and W., plt. 38, f. 15, does not agree with the description, p. 182; it does not show the subapical blotch near the apex below the costa.

The fig. of lancea in H. and W., plt. 38, f. 16, also is defective,

only the R. forewing being nearly uniformly coloured.

South, Moths Br. Is., I., plt. 128, has a very good typical figure. Seitz, l.c. p. 174, figures typical haworthii, plt. 41b, erupta, plt. 41b, and hibernica, plt. 41b, all good figures.

Warr.-Seitz treats tripuncta as a synonym of haworthii; morio a

synonym of erupta and lancea a synonym of hibernica.

Culot, N. et. G. I(1). plt. 26, gives two figs., 1 a very poorly marked, typical devoid of much light markings, and which in the text he says agrees with erupta.

In describing the Variation Barrett says—"Not usually very variable, except in the degree of whiteness of the nervures, which sometimes is much obscured or even obliterated. This in some instances extends to the whiteness of the orbicular stigma. There is a little difference also in the ground colour, which sometimes is of a redder chocolate."

Barrett records a specimen "of a pale grey, but with the paler markings quite normal."

He records also one "of a very rich purple-red and another

extremely pale olive-brown."

Dr. Cockayne says (in lit.) "On some of my York specimens the ground colour is very pale brown or buff. In East Aberdeenshire ones it is nearly black. The orbicular varies much in size and shape (and in colour) and it and the reniform are very white, in most ones."

The forms to be discussed are—

haworthii, Curtis (1829) Br. Ent. VI. 260.

subsp. hibernica, Steph. (1829) Ill. III. 16. pl. 25.

ab. lancea, Steph. (1829) l.c.

ab. tripuncta, Curt. (1829) l.c.; H. and W., I. plt. 38, f. 16.

ab. erupta, Freyer (1845) Neu. Beitr. V. 150, plt. 472.

race morio, Evers. (1842) Bull. Mosc. III. 550; Freyr. l.c. plt. 388. ssp. sachelinensis, Matsu. (1925) Jr. Coll. Agr. XV. 140. plt. 11.

Tutt treats of (1) the typical haworthii: (2) hibernica the Irish form very red: (3) lancea of small size nearly uniform in coloration: (4) tripuncta both stigmata distinct and pale, and a pale patch near the subapical costa: (5) morio the Volga form: (6) erupta with reniform and orbicular and with numerous other white markings.

Tutt gave Freyer's description and figure as the original of erupta,

but Germar's figure and description in 1827 was the original.

ab. erupta, Germar. Ahrens' Fn. Insect. Eur. XXI. (1827).

Fig.—l.c. plt. 15.

ORIG. DESCRIP.—" Affinis Agrotis celtae (Fn. Eur. fasc. IV. Hb. 16); A. lidea, Hb. Tr.; minime, Cram. sed minor. Caput et thorax nigra, antennis setaceis. Abdomine cinereum. Alae anticae atomiis cinereiis basi et ad costam adspersis, maculis ordinariis albis, fascia postica repando-dentata, squamis fuscis et maculis sagitatis nigris variegata

albida. Costa maculis aliquot albis. Ciliae nigrae, griseo-maculatae. Pagina inferior alarum anticarum nigro-fusca maculis et fusca paginae superiores. Alae posticae nigricantes, basi dilutiores, subtus concolores."

subsp. sachalinensis, Matsu. Jn. Coll. Agri. Sapporo. XV. 140 (1924-5).

Fig.—l.c. plt. XI. 16, 3 (a very bad indistinguishable figure in

black and white).

ORIG. DESCRIP.—"Reniform much larger, being bifid at the veins 3 and 4, and on its outerside with a broad, oblique, fuscous patch; at the termen in each interspace of 4 and 5 with a fuscous patch; marginal band relatively broad, and of a blackish colour; fringe yellowish, traversed by a fuscous line." S. Saghalien.

I am indebted to Dr. Cockayne for pointing out that "Helotropha leucostiqua is congeneric with Celaena haworthei both by larval charac-

ters and by genitalia."

Mamestra (Ochs. and Tr. 1816) Hb. (1822) Tr. (1825).

The genus name Mamestra was proposed by Ochs. and Tr. in 1816 (Schm. IV. 76) but not described. In 1825 Treit. (Schm. V(2), 127) described the genus quite fully. But in 1822 (Verz. 214) Hübner had adopted the genus name and described it briefly (but inadequately). Hence it seems that the genus should date from 1822.

One finds the utmost divergence of opinion as to the contents of this genus and the more modern systematists discard the use of it. The six species included by Tutt have been shifted about singly

or in groups in at least 14 different genera.

In 1816 Ochs. and Tr. proposed the following species for Mamestra—pisi, splendens, oleracea, suasa, aliena, abjecta (nigricans, View.), chenopodii, albicolon, brassicae, furva and persicariae (Schm. IV. p. 76). In 1825 Treit adequately described the genus and added rubrirena the 12th species. (Schm. V(2). p. 127). But in the meantime Hübner (Verz. p. 214) in 1822 had adopted and described the genus including in it the 3 species pisi, unanimis and leucophaea only, of which pisi alone was in the original genus proposed by Ochs. and Tr. Hence it seems that the genus should date from Hb. (1822).

Herr. Schäff., Sys. Bearb. (1845) suppressed the name Mamestra and placed the 6 species we are concerned with in his huge omnibus

genus Polia.

Guenèe in 1852 (Noct. V.=I. p. 188), places about 25 species in the genus including our six species, abjecta, anceps (sordida), and albicolon in his group II.; furva, brassicae and persicariae in his group III.

Stdgr. in 1861 (Cat. Ied. 39) places brassicae, persicariae and albicolon in Mamestra, and furva, abjecta and infesta = sordida in Hadena.

In 1871 (Cat. Hed. 101) he copied this arrangement.

South in the Entomologist Syn. List. (1884) placed the whole 6 in the genus Mamestra. Although his List was mainly an adaptation of Stdgr. Cat. 1871, he was no doubt influenced by the Doubleday List,

which British collectors of the day used almost exclusively, and accepted Mamestra as in that List. Doubleday no doubt, based his arrangement on the work of Guenèe. This List took the place of Doubleday's List and it was from it that Tutt selected his genera and species.

Meyrick (Hand. 79) in 1895, did not use Mamestra, but put brassicae, persicariae and albicolon in the genus Melanchra, Hb. and the other three

species in Hadena.

Stdgr. in 1901 simply copied his own List of 1871.

In his Moth of the Brit. Is., South (I. 270) in 1907, retained the 2 species persicariae and albicolon only for Mamestra, selected abjecta, sordida and furva for the Hama of Stephens, and brassicae he put in Barathra as Hübner had done.

Pierce in the following year 1908 (Gen. Noct. 38) placed abjecta in the genus Neuria, Gn. and the other five of Tutt's species with saponariae in Mamestra remarking that from a genitalic view, Mamestra as constituted by him was not separable from Apamea and all should be

included with Xylophasia.

Hampson, Lep. Phal. (VII. 208) in 1908, suppressed Mamestra and used the genus Trachea, (Ochs. and Treit) Hb. for abjecta=nigricans=oblonga, Haw., sordida=anceps and furva, placed albicolon in the Trichoclea, Grote, brassicae in Barathra, and persicariae in Polia, Ochs. and Treit.

Warren in Seitz in 1911 (Pal. Noct. III. 167) placed abjecta and sordida in Parastictis, Hb., furva in Crymodes, the other three as in Hampson, the name Mamestra being completely ignored.

Meyr. Revised Brit. Lep. (1927), repeated his action of 1895.

Evidently with so many diverse views we are far from stability in this group of our Noctuids.

Mamestra, Ochs.-Treit. (Hb.) Treit. (1816-1822-1825), Tutt, South. [Hadena, Schrnk. (1802), Hb., Stdgr., Cul., Meyr.: Polia, Ochs.-Treit. (1816-25), H.-S.: Trachea, Ochs.-Tr. (1816-25), Hb. (1822), Hamp.: Hama, Steph. (1829), South: Neuria, Gn. (1841-52), Dup. (1844).] abjecta, Hb. (1818) = [nigricans, View. (1789), nec. Fb., Hb. (preoc.)].

Tutt describes Hübner's figure, "Anterior wings of deep, but clear brown (almost reddish) grey, an abbreviated basal transverse line and a complete one in contact with the inner edge of the orbicular, both double; a short dark (black) longitudinal streak under base of median nervure, orbicular distinct, reniform outlined in white (lightish); an oblique line from costa to median nervure between stigmata; a wavy transverse line just beyond reniform, followed by four (five) short longitudinal wedge shaped spots. The dark longitudinal mark under the stigmata in Newman's figure (British Moths, p. 298) is absent. The hindwing dark grey on outer edge, with pale base and indistinct (no) lunule." The interpolations are mine from my copy of Hübner's Noctua.

nigricans, Vieweg. Tabell. Verz. II. 66 (1789) [placed between pisi and persicariae and thus shows the relationship as interpreted by

Vieweg].

ORIG. DESCRIP.—"Antennae, head, thorax and fore-wings are blackish. The last have a few paler transverse lines, and the usual spots depicted only very indistinctly. On the outer margin and parallel with it lies a row of dark black, separate triangular spots, and on the costa away from the apex stand four small whitish dots. The hindwings and the body are grey," Mark Brandenburg. He refers to Fab. Sys. Ent. 616, whose short Latin description he copies.

Fab. Sys. Ins. II. 238 (1781) gives Fb. Sys. Ent. 616; Linn. Sys. Nat. XIIIed. 855; and Fn. Suec. no. 1220 as references to nigricans. The description in Latin in these authors "Alis nigricantibus, maculis ordinariis pallidioribus" with the added comment of Linné "fusconigricantes magis quam in alia ulla nostratum; cannot refer to abjecta,

Hb., 539, (=nigricans, View.)

Werneburg, Beitr. II. 215, agrees that abjecta, Hb. is nigricans,

View.

Many authors have mixed the nigricans, View. with the nigricans, Linn. and Fab. as did Vieweg himself, although his description is undoubtedly that of abjecta, Hb. The nigricans of the other early authors are emphasised "black" and have no triangular black spots

in the submargin.

Treit. Schm. V(1). 141, puts nigricans, View. under fumosa, Hb. = nigricans, L. in Fn. S. and again on p. 186 under aethiops = nigricans, Hb. touches on this intricate complex in the application of the name nigricans by Linn., Schiff., Fab., Esp., de Vill., View., Hb., and Ochs. Then in l.c. V(2). he very exhaustively and clearly states the case with the following results.—I. That the nigricans, Schiff. and Fab., Illiger, Götze and Rossi belongs to fumosa. II. That nigricans, Esp. goes best with fumosa and is much too small for abjecta. III. That nigricans, Linn. agrees less with abjecta than with fumosa. Treit goes on to say that he cancels his citation of nigricans, View. to fumosa as held by Ochsenheimer, and confirms the citation to abjecta, Hb. 539, noting that nigricans, Schiff. is cited to abjecta, in error.

Stephens, Ill. 11. 193, describes and figures, plt. XXIV. 2, nigricans, which he ascribes to Vieweg. The figure is a very fair representation of our ordinary obscurely marked abjecta. There is a blue mother-of-pearl sheen on all 3 figures on the plate, which no doubt is not

intended.

Wood's figure of nigricans (after Steph.) is a very poor unrecog-

nisable one. Index, plt. XII., f. 254.

Freyer, Neu. Beitr. II. 92, calls attention to the many authors who have used the name nigricans, which, as Treitschke had stated after full examination, that abjecta, Hb. 539 and nigricans, View. referred to the same species, and that the other authors' nigricans, should be referred to fumosa and aethiops, the nigricans, Hb. 709.

Hampson, l.c. 208, identifies nigricans, View. as this species as well as the oblonga, Haw. Lep. Brit., 188 (1809). As the name nigricans is not available, he uses oblonga, Haw. as the prior specific name. In this last action he is followed by Warr. Seitz. Pal. Noct. III. but not

by Meyr. in using oblonga as the name of this species.

SPECIAL INDEX.

By Hy. J. TURNER, F.E.S., F.R.H.S.

YOL. XLIV. (new series) (1932.)

The Entomologist's Record & Journal of Variation.

Coleoptera arranged in order of Genera. The other orders arranged by Species. Genera, Species, etc., new to Britain are marked with an asterisk, those new to Science with two asterisks.

			-
PAGE		E	AGE
The following Lists of mere names	Calodera aethiops		5
are not indexed.	riparia		5
List of Coleoptera, in a Willow	Carabidae		5
Swamp in Windsor Forest, 5-6;	Carabus auratus		55
at Fontainbleau and not in	Carabus auratus violaceus		
Windsor Forest, 35; pests of	Cephennium edmondsi		150
basket willow, 47; both in	pallida		150
Windsor and Fontainebleau	Cerambycidae	• • •	34
Forests, 35; new last year in	pallida Cerambycidae Cetonia hirtella		56
Devonshire, 150; attracted to	Ceuthorhynchidius palustre		5
burnt, areas, 36; harmful in both	rufulus		5
Windsor and Fontainebleau	Choleva nigricans	• • •	6
Forests, 36; taken by sweeping	Chrysomela cerealis		35
at Slapton and Hallsand, Devon 151	Chrysomelidae		6
. at biaptoir and transand, Devon 191	Cicindela germanica		35
COLEOPTERA.	hybrida		
	Coccinella bipunctata	• •	55 55
Abax striola 57 Acupalpus elegans 147	Coccinellidae	• •	6
A color anotions	Coccinellidae		
Agabus arcticus em 77 bipustulatus	Corymbites purpureus	• •	
obelegatus 151	Crepidodera ventralis		151
chalconatus	Cryptocephalus aureolus	72,	73
A mana mathic a mula deli	Cryptohypnus dermestoides		151
Agapanthia asphodeli . 81 cardui . 56, 81 Alaeocharinae . 51	ab. 4-guttatus		151
Cardul	Cryptophagidae		6
Alaeocharinae 51	Curculionidae	6,	
Amara strenua 147	Dasytes plumbeus (oculatus)		
Anthicidae	Dermestes lardarius		
Anthicus antherinus 6	Emus hirtus		148
Aphodius sticticus 6	Enicmus transversus		6
Apion urticarium	Euconnus hirticollis Gabrius nigritulus		6
Atheta 5	Gabrius nigritulus		150
atramentaria	pennatus		150
clientula	Geotrupes		11
euryptera	Gnorimus nobilis		143
euryptera	variabilis		36
graminicola	Gyrinidae		$\cdot 51$
graminicola	Gyrinus elongatus		
vestita 151	urinator		151
Bagous argillaceus	urinator Haemonia mutica v. curtisi		148
Baris scolopacea 148	v. curtisi		148
Berosus spinosus	appendiculata Helophorus laticollis		148
Blaps mucronata 72	Helophorus laticollis		5
Brachelytra 51	Hydrophilidae,		5
Brachelytra	Hydrophilidae Ipidae	. *: 1	34
Byturus fumatus	Laccobius nigriceps Larinus sternus		151
tomentosus 93	Larinus sternus		72
	Lathrydiidae		6

				PAGE)	TD.	AGE
Lema erichsoni				151	Strangalia armata		143
nuncticallia (ava	nolle)	• •		151			
puncticollis (cya Leptura aethiops Lionychus quadrill	nenaj	• •			aurulenta	• •	42
Leptura aetniops	• •	• •	• •	57	Strophosomus retusus	• •	151
Lionychus quadrii	lum	• •		150	Telephoridae Telephorus rustica Toxotus meridianus		6
ab. bipunctatus		• •		150	Telephorus rustica	5 6,	57
ab. unicolor	• •			150	Toxotus meridianus		43
Longitarsus pelluci	idus				Trochus fulyus (lonidosus)		151
Lycidae				31	Trichius fasciatus Trichodes alvearius Tricopterygidae Trichopteryx fratercula		74
Malachius aeneus				56	Trichodes alvearius		57
elegans				151	Tricoptervgidae		6
marginellus				151	Trichontervy		5
viridie	••	•	• • •	151	fratoroula		6
villano	• •	• •	• •	148	Travercula	• •	U
Madon	• •	• (DIPTERA.		
Medon	• •	• •	0 11	162			100
pecuniventris	• • •	• •	• •	151	alneti, Didea	• •	123
Melanophthalma i	uscula	• •			anthracina, Psilota		93
Lionychus quadrillab. bipunctatus ab. unicolor Longitarsus pelluci Lycidae Malachius aeneus elegans marginellus viridis vulneratus Medon pectiniventris Melanophthalma f Melanotus vittatus Meloë brevicollis Melolontha vulgari		• •	• •	57	alneti, Didea anthracina, Psilota Asilidae bipunctatus, Sargus bisignatus, Therioplectes borgalis Therioplectes		13
Meligethes morosu	8	• •			bipunctatus, Sargus		42
Meloë brevicollis	• •		56,	72	bisignatus, Therioplectes 37	7, 38,	39
Melolontha vulgari	S		56,	72	borealis, Therioplectes borussica, Hydrotaea bovinus, Tabanus		37
Metabletus foveatu	s (foveo	lus)		150	borussica, Hydrotaea		123
ab. unicolor		′		150	bovinus, Tabanus		38
ab. unicolor Micrambe villosa				5	cristatus, Trichopticus, Lophos	seles	123
Mordellidge	• •	• •		6	Chrysozona (Haematopota)	300100	37
Mordellidae Mylabris variabilis		• •		74	Chrysons	• •	20
Manual and month	7031150	• •	• •	56	eventorum Frietelia	• •	100
Necrophorus morti	uorum	• •	• •		displant Dembelies	• •	125
Nitiaunaae	• •	• •	• •	6	discolor, bombyllus	• •	99
Oberea oculata	• •	• •	• •	35	distinguendus, Therioplectes		39
Olibrus aeneus	• •	• •	• •		fasciolatum, Chrysotoxum		57
Othius laeviusculu	S			150	ferruginea, Coelomyia		74
Necrophorus morti Nitidulidae Oberea oculata Olibrus aeneus Othius laeviusculu Oxypoda maritima nigrocineta salictaria Paederus fuscipes riparius Pagodus luridipeni Phalacridae Philonthus bimacu				150	cristatus, Trichopticus, Lophos Chrysozona (Haematopota) Chrysozona (Haematopota) Chrysozona (Haematopota) cryptarum, Eristalis discolor, Bombylius distinguendus, Therioplectes fasciolatum, Chrysotoxum. ferruginea, Coelomyia festivum, Chrysotoxum ferox, Echinomyia. flavidipennis, Chortophila, Mudaria floralis, Nemorilla glaucescens, Fannia glaucopis, Tabanus grisea, Hammomyia Haematopota = Chrysozona haemorrhoidalis, Sarcophaga heterobia, Rhabdophaga Hylephila intumata, Platypeza intermedia, Didea irritans, Hydrotaea italicum, Chrysotoxum laternarius, Ischyrosyrphus latifrons, Sarcophila Lophosceles = Tricopticus linearis, Dioctria meridionalis (sudeticus Tabanus miki, Tabanus	5 5 ,	73
nigrocineta	• •			5	ferox, Echinomyia		123
salictaria				5	flavidipennis, Chortophila, 1	Delia.	
Paederus fuscipes				150	Nudaria	122.	131
riparius				150	floralis, Nemorilla	,	10
Pagodus luridinent	nis			147	glaucescens Fannia		199
Phalacridae		• •			glauconis Tahanus		199
Philonthus bimacu	lotua	• •	• •	150	glandopis, Inbanus		25
I mionumus bimaet	ilauus	• •			gradeus, Tabanus		109
varius Phyllopertha horti Polystichus connec		• •	• •	150	grisea, nammomyta	• •	120
Phylioperina north	cora	• •		57	Haematopota = Chrysozona	• •	37
Polystichus conne	kus	• •		147	haemorrhoidalis, Sarcophaga	• •	122
Proteinus macropt Pselaphidae	erus	• •	• •		heterobia, Rhabdophaga		47
Pselaphidae		• •			Hylephila		122
Psilothrix cyaneus	(nobilis	3)		151	infumata, Platypeza		122
ab. viridis				151	intermedia, Didea		123
ab. viridis Pyrochroa coccine serraticornis Pythidae	a			131	irritans, Hydrotaea		123
serraticornis					italicum, Chrysotoxum		57
Pythidae					laternarius, Ischvrosyrphus		122
Rhinosimus planir	ostris				latifrons Sarcophila		129
					Lonhosceles - Tricontians	• • •	199
Convehenidae	MICUA	• •	• • •	2.71	linearia Dicetria		100
Sama and a hhavin	4120	• •	151	160	movidionalia (andetiona	aam)	144
ocopaeus abbrevia	lus	• •	101,	102	The homes (sudeneus	ssp.),	9.0
minutus		• •	• •	190	Tabanus		56
ryel	1.9.4		• •	120	miki, Tabanus	c =	37
Scydmaenidae		• •	• •	6	modesta, Helomyza		122
Selatosomus cruci	atus			35	montanus, Therioplectes	37,	38
Silpha obscura				73	meridionalis (sudetious Tabanus miki, Tabanus modesta, Helomyza montanus, Therioplectes morissii, Beris mussitans, Arctophila neilseni, Ernestia obtusa, Hylephila perpleyus (sudetious 2021) Ta		122
thoracica				72	mussitans, Arctophila	• •	123
Silphidae				6	neilseni, Ernestia		122
Spondylis buprest	oides			35	obtusa, Hylephila		122
Staphylinidae		*.4	5.	48			
Rhynchites germa Scarabaeidae Scopaeus abbrevia minutus ryei			-,	162		38.	39
nusillus				150	personata, Hylephila	,	129
Panian			• •	-50	niniona Spritta		56

			PAGE	1	PAGE
plebejus, Atylotus			37	magdalenae, Lissonota	. 77
piecejus, Asylvius	• •	• •	57		
ribesii, Syrphus	• •	• •	57	meridiana = hypnorum	
ribis, Macrophya	• •	• • •	57	Meteorus	
runcauda, Neoleria		• •	122	muraria, Chalicodoma 56, 57	
ribesii, Syrphus ribis, Macrophya ruficauda, Neoleria rufipalpis, Phaonia rustica Devia	• •		122	niger, Acanthomyops	
rustica, Dexia rusticus, Machimus	• •	• •	123	parietum, Odynerus	
rusticus, Machimus		• •	123	perplexa, Alloxysta	86
sponsa, Hylephila			122	pictus, Odynerus	57
solstitialis, Therioplectes		9.4	39	Pireninae	86
solstitialis, Therioplectes sudeticus, Tabanus		38,	39	Pireninae polytomus, Diprion	m ()
Tabanus (idae) 1	3, 3	7, 38,	39	pratense, Formica	
terranovae, Protocalliphor	ra		122	pratorum, Bombus 56	
tessellata, Empis			57	pyrrhogaster, Micromelus	~ ~ ~
Triconticus (Lonhosceles)	• • •	• • •	123	quatuor-lobum = laterale	
Tricopticus (Lophosceles) tropicus, Therioplectes		38	39	11 00 4 41 1	0.0
				A 77	
Trypetidae	• •		94	rufa, Formica	PH (2)
HYMENOPTI	FD	Δ		sabulosa, Ammophila	w 0
				sanguinea, Formica	
anomala, Cryptopimpla	• •	76,	77	scrimshiranus, Bombus	
Apanteles			101	solitaria, Tenthredella	
Aprostocetus			86	stigma, Tenthredopsis	73
Apanteles			146	subterraneus (latreillellus) Bombus	
Belonogaster			154	sylvarum, Bombus 57	
bellicosus, Cremastus			23	tarsalis Lamprotatus	
hifasciatus, Allantus			73	temula, Tenthredella . 57, vernalis, Lissonota	
Chalcididae	• •	32	86	vernalis, Lissonota	
olavellatus Missotorys	• •	02,	98	vertalis, Dissolited	
care human /hautauran	~ `	Dam	00	vestalis, Psithyrus	
Concoolings (Bortordal Ca	,,	20111		viaticus, Anoplius, Pompilus	73
bus			55	LEPIDOPTERA.	
corruptor, Gelis, Pezomac	nus	• •	86		
Cynipides	• •		86	List of Lepidoptera, in Kabylia in	
Cynipides		57,	72	1931, 12, 90; from Surrey and	
epigonus, Pleurotropis			86	Sussex, 15; pests of the basket	,
*filicornis, Ecrizotes			86	willow, 47; from Salonica 1918-	
flavicornis, Tenthredella			73	19, 61; Seitz additions to forms	
flavus, Acanthomyops			86	of British species, 65; Noctuids	
fuliginosus Agenthomyon	CI .		86	of which notes are wanted, 94;	
fusca. Formica			86	in Mosley's "Illustrations," 102,	
fuseus Pezomachus	• •		73	'124 135 · Rhonalogers in the	,
gerstäckeri Rombus	• •	• • •	55	124, 135; Rhopalocera in the Pulborough area, 127; British	
gerstacker, Dombus	• •	• •	23	Darabides 124 : alaine forms of	
geryonis, Apanteles	• •	• •	73	Psychides, 134; alpine forms of,	
fusca, Formica fuscus, Pezomachus gerstäckeri, Bombus geryonis, Apanteles gibbus, Sphecodes gigas, Sirex glabaria (fusca ab.), Form	• •	100		Bulgaria, 146; butterflies with	
gigas, Sirex		129,		lethargic pupae, 159; immi-	
glabaria (iusca ab.), Form	ıca	• •	86	grant species for special observa-	
Habiodytus	• •	• •	86	tion and note	162
Halticoptera		• •	86	abbreviata, Eupithecia	45
battorfiana, Andrena	• •	56,	72	abdelkader, Satyrus	8
hessae, Andrena			73	abietella, Doryctria	83
hirsuta, Ammophila			74	Abraxas	96
Halticoptera hattorfiana, Andrena hessae, Andrena hirsuta, Ammophila hortorum, Bombus			55	grant species for special observa- tion and note	134
hypnorum (meridiana),	Bo	mbus		achilleae, Zygaena	138
-J E,		55,	56	actaea. Satyrus. Nytha	149
Ichneumonidae		•••	86	actaeon = acteon	66
Ichneumonidae ignita, Chrysis	• •		73	action Themolieus 60	66
instabilis, Gelis, Pezomach	• •	• •	1	acteon, Inymencus 00,	77
		• •	86	adippe=cydippe	60
lapidarius, Bombus		43.5	56	actaeon = acteon	60
laterale (quatuor-lobum), I	roa	nthi-	=-	advena, Mamestra	95
dium laticeps, Halictus			72	advenaria, Cepphis, Epione	15
laticeps, Halictus	• •		55	aegeria, rararge 2, 12, 41, 01, 09,	
latreillellus = subterraneus			57	76, 90,	92
			56	Aegeriidae	95
longicornis, Eucera			55	aegon, Plebeius 40.	65
luteus, Ophion			73	Aegeriidae	149
ligniperdus, Camponotus longicornis, Eucera luteus, Ophion maculipennis, Arthrotylus		• •	86	aestiva (medon ab.), Plebeius, Aricia	96
				,,,,,,,,	-

PAGE	PAGE
aestivalis(dispar gen. aest.), Chryso-	athalia, Melitaea 14, 27, 30, 72, 80,
phanus 79	
aestivaria (strigata), Hemithea	atomaria, Ematurga
aetherie, Melitaea 58	atrata, Odezia, Tanagra 70, 73
aethiops, Erebia 167	atropos, Manduca 41, 62, 160, 163, 164
aetherie, Melitaea	aurana, Laspeyresia 27
aglaia, Argynnis	aurantiaca (rhamni ab . β), Gonep-
Agriades52	teryx
Agrotidae	aurea (napi ab.), Pieris 60
ala, Melitaea	aureliaeformis (britomartis r .),
alba (rhamni ab. ?), Gonepteryx 138	Melitaea
	aurelia = parthenie, Bork., Melitaea
albidice (daplidice ab.), Pontia 7	
albicillata, Mesoleuca 25	auresiana (cydippe = adippe ssp.),
albiluna (fasciuncula ab.), Miana,	Argynnis
albipuncta, Leucania	auricoma, Acronicta 95
albipuncta, Leucania 83	aurinia, Melitaea 2, 15, 30, 58, 79,
albovenosa, Arsilonene	81, 84, 138
albulata, Perizoma	ausonia (belia), Anthocharis 7, 12, 75, 76, 91
alceae, Erynnis	
	australaria (rhomboidaria ab.),
algirica (aetherie ssp.), Melitaea 58	Boarmia 46
algirica (semele ssp.), Hipparchia 8	automate (phileta = monuste ssp.),
alligata = fasciata	rieris
allionia (Statilinus Tace), Satyrus 149	autumnata, Oporinia
alpestrella, Bankesia	avis, Callophrys
alpestris (achilleae ssp.), Zygaena 138 alpestris (didyma race), Melitaea 139	halomica (attornana sen) Erobia 166
alpine (ounbroagne a) Bronthia	hallad Thorton 50 75 76: 09
alpina (euphrosyne r.), Brenthis,	Dankssia 117
oleines Caredrine	**hagidistingto (vostigialis ab)
Boloria	automate (phileta = monuste ssp.), Pieris
Melanippe, Xanthorhoë 25, 56, 85	basistriata (auricoma ab.), Acronicta 95
Alucitidae = Pterophoridae	basisuffusa (croceus ab.), Colias . 157
alvens Hesperia	batavus (dispar ssp.), Chrysophanus 79
amphidamas Loweis 74	batis, Thyatira
alveus, Hesperia	batis, Thyatira
anglica (mellioti $race$). Z \sqrt{g} aena 138 \pm	Turanana 59. 81
angustana = cruciana 63	haumanniana Chlidonia 83
angustana = cruciana 63 anka (euphrosyne r.), Boloria, Brenthis 120 answina (euphrosyne r.), Brenthis,	helemia, Anthocharis 7, 75, 76, 90,
Brenthis 120	91, 149
answina (euphrosyne r.). Brenthis.	belia = ausonia 7, 12, 75, 76, 91
	bellezina (tagis ssp.), Anthocharis 81
anthrax = nigroviridescens 88	bellargus = thetis
antiopa. Euvanessa	berisalii (deione r.), Melitaea 140, 141
anthrax = nigroviridescens	betulae, Ruralis, Zephyrus. 2, 13
apennina (euphrosyne r.). Brenthis.	betularia, Biston 25
Boloria 111, 112, 121	bicolor, Leucodonta. 3, 161
aphirape, Brenthis, Boloria 119, 120	bicolorana, Hylophila 83, 128
apicella, Coleophora 66	bicoloria = furuncula 139
apollo, Parnassius 73, 120	bidentata, Gonodontis 25
arcanoides, Coenonympha 8, 92	Bijugis 97, 133, 134
Arctiidae 4	biligata = striata 89
argiades, Everes 59, 73	bilineata, Euphyia, Camptogramma
argiolus, Lycaenopsis 3, 41, 59,	25, 70, 85
69, 73, 92	bilunaria, Selenia 25, 70
Argynnis	bimaculata, Bapta 25
argyrognomon, Plebeius 40	berisalii (deione r .), Melitaea 140, 141 betulae, Ruralis, Zephyrus. 2, 13 betularia, Biston . 25 bicolor, Leucodonta . 3, 161 bicolorana, Hylophila . 83, 128 bicoloria = furuncula . 139 bidentata, Gonodontis . 25 Bijugis . 97, 133, 134 biligata = striata . 89 bilineata, Euphyia, Camptogramma . 25, 70, 85 bilunaria, Selenia . 25; 70 bimaculata, Bapta . 25 binaevella, Homoeosoma . 26 binaria, Drepana . 15 bioculata, (jurtina ab .), Epinephele 128
Aricia 52	binaria, Drepana 15
arion, Lycaena 60	bioculata, (jurtina ab.), Epinephele 128
Boloria	hinunillata (aegeria ab.). Pararge 61
astrarche = medon 15, 31, 65	bipupillata (megera ab.), Pararge 1. 61
atalanta, Pyrameis 2, 58, 75, 92,	biselata, Ptychopoda 25, 66
93, 130, 156, 157, 167, 168	bipupillata (megera ab.), Pararge. 61 biselata, Ptychopoda . 25, 66 bisetata = biselata 25,

PAGE	PA	GE
bistortata, Ectropis, Boarmia 45, 70	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	4.0
blandiata Davizama	celadussa (athalia r.), Melitaea	92
Diaminia	Celerio 163, 1	64
hoeticus Lampides 59	centauresta Eunithecia	85
Roloria (Brenthis)	centum-notate (truncate ab)	00
hambreella Diingia 125	Dragtrome (truncata ao.),	10
bombycena, bijugis 155	Dyssirona	10
bowerella, Masonia	cesarea, Diacrisia	82
bractea, Piusia	chariclea, Brenthis, Boloria 1	119
	chaonia, Drymonia	82
brassicae, Mamestra 23, 94 brassicae, Pieris 11, 12, 23, 69, 75,	charlonia, Euchloë	7
brassicae, Pieris 11, 12, 23, 69, 75,	chenopodiata(mensuraria, limitata),	
76, 83, 88, 89, 90, 130, 156	Ortholitha 25, 69,	85
bremeri, Parnassius 120 Brenthis = Boloria 110 britomartia Malitana 28 29 70 71	chi, Polia 1	61
Brenthis = Boloria 110	Chlidanotidae	31
britomartis, Melitaea 28, 29, 70, 71,	chlorosata, (petraria), Lithina,	
72, 140	Lozogramma 26.	70
briseis, Satyrus, Hipparchia 8, 111	christvi. Oporinia 1	63
brogotarus (pales r .), Boloria,	chrysanthemana Chenhasia	27
Reanthis 149	ahrzenrhoes — phaeorrhoes	65
Brenthis	cinctorio Poermio	1.5
brunnea (fucosa ab.), Hydroecia 158	cincula, Dourina	64
	cinerea, Euxoa, Agrous (2, 1	.04
brunnea (lucens ab.), Hydroecia 158	cinarae, nesperia	.49
brunnea-albo (fucosa ab.), Hydroecia 158	cinxia, Mentaea 57, 58, 72,	75
brunnea-albo (lucens ab.), Hydroecia 158	circellaris, Amathes 24, 1	.60
bryoniae (napi subsp.), Pieris 74 bucephala, Phalera 3, 70	citraria = ochrearia	66
bucephala, Phalera 3, 70	clathrata, Chiasmia 15,	26
burdigalensis (dispar=rutilus ab.),	cleopatra, Gonepteryx 7,	76
burdigalensis (dispar=rutilus ab.), Chrysophanus 79	chenopodiata (mensuraria, limitata), Ortholitha	42
bureschi (lucernea ssp.), Agrotis 146	coerulata (impluviata), Hydriomena	25
caecilia (ida r.), Epinephele 8	cognata, Procris 17, 18, 19,	62
caerulea (icarus ab.), Polyommatus 92	Colias 1	45
caeruleocephala, Diloba 85	Coleophora (Eupista)	66
caeruleocephala, Diloba 85 caesiata, Entephria 25	comes, Agrotis	83
caia, Arctia 4, 65, 69, 84, 138 c-album, Polygonia	comma, (Adopaca) Urbicola 61, 1	49
3-album, Polygonia	comma-notata (truncata ab.),	
calidonica (achilleae r.), Zygaena 138	Dysstroma	10
calidonensis (purpuralis r.), Zygaena 138	complana, Lithosia	15
caliginosa, Acosmetia 15	conigera. Leucania	24
caliginosa, Acosmetia 15 callunae (quercûs f.), Lasiocampa 41	consonaria. Boarmia	26
calodactyla, Platyptilia . 63, 64	conspersa. Dianthoecia	23
calvada (euphrosyne r.). Brenthis.	coerulata (impluviata), Hydriomena cognata, Procris 17, 18, 19, Colias. 17, 18, 19, Colias. 18, 19, Coleophora (Eupista) 18, 19, 19, 19, 19, 19, 19, 19, 19, 19, 19	
Boloria	Xylomiges	82
amelina Lonhontervy 3	conspureatella. Bankesia 117 1	18
caniola Lithosia 8 31	constancella Psyche	83
anteneri (rumina ah) Zervnthia	constancella, Psyche convolvuli, Agrius, Herse 41, 1 cordigera, Anarta 1 coridon, Polyommatus 15, 31, 65,	64
Thais 91	cordigera Anarta 1	01
Thais 91 capsophila, Dianthoecia 23	coridon Polyommatus 15 31 65	.01
carbonaria=doubledayaria(betularia	66, 111, 149, 1	61
<i>ab.</i>), Biston	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	-
ab.), Biston 25 carbonaria, Isturgia 101	cornicana, Argyrophoce, 1 acurses 05, 1	21
cardamines, Euchloë 2, 7, 30, 60, 69	cornices, Agrons, Muxoa 25, 1	66
andui Drummia 9 19 12 41 59	corylete Eurhyie	00
cardui, Pyrameis 2, 12, 13, 41, 58,	Coryland, Euphyla 25,	00
75, 76, 90, 92, 128, 130, 156, 157,	Cossinae	90
161, 167, 168	crameri = bena 7,	12
carlinella, Metzneria 83	crataegena, Scoparia	26
earmelita, Lophopteryx 45	craetaegi, Aporia	73
parlinella, Metzneria 83 carmelita, Lophopteryx 45 carpinata, Nothopteryx 45 carpophaga, Dianthoecia 130, 23	corticana, Argyropioce, Faedisca 63, 1 corticea, Agrotis, Euxoa 23, 1 corydon = coridon corylata, Euphyia crameri = belia crataegella, Scoparia crenana, Eucosma, Epiblema 63, 1 cribraria, Coscinia crinanensis, Hydroecia	77
earpophaga, Dianthoecia . 130, 23	cribraria, Coscinia	31
carsicola(partnenie=partnenoides	crinanensis, Hydroecia 24, 1	46
r.), Melitaea	croceago, Xantholeuca	82
eastanea, Noctua 97, 101, 119	croceago, Xantholeuca croceus (edusa), Colias 2, 7, 12, 15,	
rational parthenia \cdot 150, 29 mastanea, Noctua \cdot 29 mastanea, Noctua \cdot 97, 101, 119 mastar, Eriogaster \cdot 82 mataleuca (brassicas ab .), Pieris \cdot 82 mataleuca (brassicas ab .), Pieris \cdot 82	41, 76, 92, 130, 145, 156, 1	
atax, Eriogaster 82	crocogrammos (a in error) = lineolea	66
eataleuca (brassicas ab.), Pieris 82	cruciana (angustana), Eucosma	63

PAG	GE	1	PAGI
	69	**aminana (amakanama a) Duan	
	23	this, Boloria	11:
culiciformis, Synanthedon	15	Epicnopterix, vgidae 133.	13
	77	epiphron, Erebia	16'
	81	Erebia 58.	16'
cynosoma (euphrosyne r .), Brenthis,		Eninens (euphrosyne 7.), Brenthis, Boloria Epicnopterix, ygidae	16'
Boloria	20	erinna Erebia 166.	16
Boloria	64	**erinnvn = erinna	160
		erythroides (nurnuralis r.) Zygaena	158
this Boloria	20	erythromelas Eugonia	59
denhne Brenthic Roloria 1	10	erythromelas, Eugonia esculi (ilicis ssp.), Strymon (aesculi	0,
denlidice Pontie 7	01	in arrow)	140
defolierie Hubernie	57	in error)	11/
defolialla Bankoria	18	eugenia, Dienthis, Dolona	7/
this, Boloria	10	eupheno, Euchloë, Anthocharis 7,	1 .
deignelle (deigne a.) Melitage	40	75, 76,	06
delina mbashas	90		
denus = pnoebus	20	euphenoides, Anthocharis, Euchloë	10
densor (euphrosyne r .), Brenthis,	10	euphorbiae, Celerio	104
Doloria	12	euphrosyne, Brenthis, Boloria 56	
Boloria	23	69, 84, 110, 111, 112, 113, 114,	4 4 4
derasa = pyritoides	69	119, 120,	141
derivata (nigrofasciaria), Anticlea,		Eupista = Coleophora euryale, Erebia	68
Coenotephria 70,	85	euryale, Erebia 14,	167
	58	Eurymus	145
desertorum (belemia r.), Anthocharis	7	eurytheme, Colias 172,	174
desfontainii, Melitaea	58	Euxoa	164
destrigata (defoliaria ab.), Erannis,		evagore, Teracolus	7
Hybernia 18	57	evanescens (belemia ab.), Antho-	
Hybernia 18 dia, Brenthis, Boloria 112, 13	14	charis	7
diamina (dictynna), Melitaea 70, 71,	1	eversmanni, Parnassius	120
73, 80, 18	39	evias, Erebia	167
dictynna = diamina 70, 71, 73, 80, 13	39	exigua, Laphygma	156
didyma Malitaga 58 09 119 190 15	20	eversmanni, Parnassius evias, Erebia exigua, Laphygma exoleta, Calocampa 24, 43, 44,	160
didyma, Hadena, Apamea	57	extrema (spadicearia = ferrugata	
dilutata = nebulata 16	63	ab.). Xanthorhoë, Coremia	158
dimidiata, Ptychopoda 2	25	exulans, Zygaena 21,	99
discobolus, Parnassius 19	20	exulans, Zygaena 21, fagi (alcyone), Satyrus, Nytha fagi, Stauropus falloui (belemia r.), Anthocharis	8
dispar, Chrysophanus	79	fagi. Stauropus	9
distincta (belemia ab.). Anthocharis	7	falloui (belemia r.). Anthocharis	7
divergens (athalia Gp.), Melitaea	14	fascelina, Dasvehira 16.	101
	85	fascelina, Dasychira 16, fasciana, Erastria	24
dominula Callimorpha	15	fasciana, Erastria fasciata (brassicae ab.), Pieris	89
J 11	F 4	fasciata (carpinata ab.), Nothopteryx	44
dornis, Heodes	72	facciunaula Miana Oligia	145
dorsana Lagnevregia	83	fasciuncula, Miana, Oligia fatua, Satyrus, Nytha fausta, Zygaena favicolor, Leucania favillaceana, Capua feisthamelii (podalirius f), Papilio fenestrella, Thyris	2 8
doubledavaria — carbonaria	25	fausta Zvogena	169
douglagella Bankasia 11	18	faviorior Lengania	12
Drangnidae	4	favillaceana Canna	97
dubitalia Sacraria	96	foiethamolii (nodalirius f) Panilia	01
duplana Evetria	09	for a controller Thereig	70
duplaria Polimpacetia	9	fenestrella, Thyris	110
duparis, rannipsesus	5	ferenaultena, Luma	110
**draweiteren sie (etteren en VEnebie 10	c c	ferrugans, Scopula, Flonea 24, 20,	150
darminoronsis(ottomana, i); Ereona re	00	ferrugata = spadicearia	100
edusa = croceus 2, 7, 12, 76, 92, 14	10	fervida, (rhamni ab.), Gonepteryx	190
edwardsella, Masonia	18	fervida (rubi ab.), Callophrys	92
enormata, Anaitis	19	restucae, Piusia	24
edwardsella, Masonia	92	fervida (rubi ab.), Callophrys festucae, Plusia festiva, Poecilonota. festiva (hebe), Eucharia	53
egerides (aegeria ssp.), Pararge 6	69	restiva (hebe), Eucharia	82
electo, Colias 14	45	rettigii, Coenonympha	0
electo, Colias	54	Fidonia	96
eleus (phlaeas f.), Rumicia 5	59	niipendulae, Zygaena 15, 26,	85
elinguaria, Crocallis 2	25	fimbria, Triphaena	83
elpenor, Eumorpha, Pergesa 3, 156, 16	54	fingal (euphrosyne r .), Brenthis,	
emigrisea (brassicae ab.), Pieris 8	39	Boloria 114, 115, 119,	121

PAGE	PAGE
firmata, Thera 101	halterata (hexapterata), Lobophora
flammea (piniperda), Panolis 82	57, 8 5
flammea (empyrea), Rhizotype 83	hamza, Adopaea 60
flava (daplidice ab.), Pontia 7	hansii (statilinus ab.), Satyrus,
flava (thaumas, linea), Adopaea 60,	Nytha. 8
69. 145	hastata, Eulype 25, 70 hebe = festiva 82 hectus, Hepialus 26
flava (lutea), Xanthia 24 flavago=lutea 24 flavicinctata, Entephria 64 flavicornis, Polyploca	hebe = festiva 82
flavago=lutea 24	hectus, Hepialus
flavicinctata, Entephria 64	hectus, Hepialus 26
Assissment Delevels 42 44 60	hegemone, Brenthis, Boloria 119, 120
flavicornis, Polyploca43, 44, 69	helvetica (pseudathalia), Melitaea
navidior (simpionia ao.), Antho-	80, 140
charis 73	Hepialidae 26, 95
flavomacula (caja ab.), Arctia 138	herbariata, Ptychopoda 32
flavopicta (brassicae ab.), Pieris 88, 89	herbariata, Ptychopoda 32 Hesperiidae 13 hibernicella, Masonia 119 hippothoë, Heodes 74
floslactata (remutaria) Acidalia 25	hibernicella, Masonia 119
fluctuata, Xanthorhoë 85	hippothoë, Heodes 74
fluctuosa, Palimpsestis 3	hippocastanaria, Pachynemia 15
fluctuata, Xanthorhoë	hippothoë, Heodes
foenella, Eucosma 81	hispana, Polyommatus 149
fontis, Bomolocha 16, 24	hirtaria, Lycia, Biston 44, 45
forficellus. Schoenobius 26	holygumi (defelienie ab \ Tuomnia
fortunate (instinction) Trinochele	holmgreni (defoliaria ab.), Erannis,
	Hybernia 157
freija, Brenthis, Boloria 114, 119	humiliata (osseata), Ptychopoda 15
freija, Brenthis, Boloria 114, 119 frigga, Brenthis, Boloria 119 fritillum, Hesperia 150 fuciformis, Hemaris, Haemorr-	humuli, Hepialus 85 hyale, Colias 7, 74, 146, 156
fritillum, Hesperia 150	hyale, Colias 7, 74, 146, 156
fuciformis, Hemaris, Haemorr-	hylas (dorylas), Polyommatus 72
hagia 164	hyperantus, Aphantopus 65, 69, 90, 146
hagia	iberica (aurinia r.), Melitaea 58
fucosa-albo (fucosa ab.). Hydroecia 158	
fuliginosa, Phragmatobia 15, 31 fulvata, Cidaria 25	iberica (quercûs r .), Strymon, Zephyrus
fulvata, Cidaria 25	icarus, Polyommatus 3, 15, 31, 57,
fulvocincta (jurtina ab.), Epinephele 128	58, 59, 69, 76, 92, 161
Turnes sides 07 119 122 124	
Fumea, eidae 97, 118, 133, 134 furuncula (bicoloria), Miana, Oligia 139	ida, Epinephele 8
furuncula (bicoloria), Miana, Oligia 159	ilicis, Strymon, Thecla 59 imitaria, Acidalia 16
Tilsealls Botys 25	imitaria, Acidalia 16
fuscantaria, Ennomos 161 galathea, Melanargia 8, 30, 48, 61, 146 galiata, Epirrhoë	**imitatrix (parthenie=partheno-
galathea, Melanargia 8, 30, 48, 61, 146	ides r.), Melitaea
galiata, Epirrhoë 25, 130 gamma, Plusia 24, 85, 128, 130, 156,	immaculata (arion ab.), Lycaena 60
gamma, Plusia 24, 85, 128, 130, 156,	immorata, Acidalia
157. 167	impluviata = caerulata 25
gardeina (pronoë r.), Erebia 165 gemina, Apamea	incerta, Taeniocampa 44
gemina Anamea 23	ines, Melanargia 8
gemmaria - rhomboidaria 26 46	iners (suspecta). Dyschorista 24
geniculous Cuembus 26	infra-fasciata (brassicae ab.), Pieris 89
Competition 20	(,
Geometridae 25 germanica, Fumea 119	
germanica, rumea	interjecta, Triphaena 23
glauce (belemia ssp.), Anthocharis 7	intermedia (aegeria r .), Pararge 8
globulariae, Procris 17, 18, 19, 21, 62	intermedia-albo (fucosa ab.),
glyphica, Euclidia	intermedia-albo (fucosa ab.), Hydroecia
gothica, Taeniocampa 44, 85	interrogationis, Plusia 101
gothicina (gothica ab.), Taenio-	interscindana, Laspeyresia 55, 54
campa 44, 45	io, Vanessa 2, 58, 69
	Iolana 52
grevillana = staintoniana 63 grisea-albo (fucosa ab.), Hydroecia 158	Iolana
grises (fucoss ab) Hydroecis 158	iphioides, Coenonympha 149
grisea (fucosa ab.), Hydroecia 158 grisealis, Zanclognatha 24	irrorella, Endrosa, Philea 15, 31
griseopicta (brassicae ab.), Pieris 89	igaballas Grasllais 164
	isabellae, Graellsia
griseothoracea (tiliae ab.), Mimas 30	ismenias, riedelus
grossulariata, Apraxas 130	jacobaeae, nipocrita 4, 84
grossulariata, Abraxas 130 guenéei (nickerlii ssp.), Apamea,	janira = jurtina 145
Palluperina 79 **haggarti (rhomboidaria ab.),	ismenias, Plebeius
**haggarti (rhomboidaria ab.),	japygia = russiae 149
Boarmia 46	jaspidea, Valeria 83
	jerdoni, Brenthis, Boloria 110

. PAGE	PAGE
	Irobnitia Cucullia
juniperana, Laspeyresia 55	Tychnins, Cucuma 144
jurtina (janira), Epinephele 2, 8,	lychnitis, Cucullia 144 Lycaenidae, Lycaena
69, 90, 128, 142, 145	lyllus (pamphilus ssp.), Coenonym-
kamtschadalis (euphrosyne r.), Brenthis, Boloria	
Drenthis, Doloria 121	Lymantriidae
kijevana (purpuralis r.), Zygaena 158	lyssa (maera r.), Pararge 8
lacertinaria, Drepana 4 lachesis, Melanargia	machaon, Papilio
lacheria Melanargia 149	macilenta, Amathes 24
lacticals, inclanaigia	Machenia, Amantes
	Macroglossum 65 macularia, Pseudopanthera 25 maera, Pararge 8 magna (deiore r.), Melitaea 141 **magnaclara (euphrosyne r.).
lambessana (abdelkader r.), Satyrus 8	macularia, Pseudopanthera 25
lapideana, Argyroploce 81 lapidella, Luffia 118, 119	maera Pararée
lamidella Turffe	macra, faranco Melitano 141
iapidena, Luma 118, 119	magna (defone 7.), Mentaea 141
lapponaria, Poecilopsis, Nyssia 43, 45	**magnaclara (euphrosyne r .),
lapponica (euphrosyne r.), Boloria,	Brenthis, Boloria 120
Brenthis	magnaclara (dictynna = diamina r.),
Tadianada	Magnaciara (dictynna – diamma 7.),
Lasiocampidae , 4	Melitaea 139
lathonia, Issoria 58	mahommedani (sao = sertorius r .),
latruncula, Miana, Oligia 95, 145	Hesperia, Powellia 98
levethores Carehardus 50	
lavatherae, Carcharouds 55	major (briseis r.), Satyrus, Hippar-
lentiscaria, Scodiona 83 leodiensis (urticae ab.), Aglais 32	chia
leodiensis (urticae ab.), Aglais 32	malvae, Hesperia
leonina (dia r.), Boloria, Brenthis 112	malvoides Hesperia 74
lenidii (haranian al) Diania	marvoides, Hesperia
lepidii (brassicae ab.), Pieris 89	manni, Pieris
leporina, Acronicta 84 leucographa, Pachnobia 45	manto, Erebia 167
leucographa, Pachnobia 45	margaritata, Campaea, Metro-
leucophaea, Pachetra, Luperina 15, 83	compo 85 155
	Campa
leucophaearia, Hybernia, Erannis	marginaria, Erannis
15, 70	malor (oriseis 7.), Satyrus, Hipparchia
leucostigma (didyma ab.), Hadena 157	marmorinaria (leucophaearia ab.),
licula Ovrhodia 160 176	Francis Hybornia 70
ligura, Orribodia 100, 170	Erannis, Hybernia
ligula, Orrhodia	Erannis, Hybernia
limitata = chenopodiata 25, 69, 85	Masonia 118, 119
lineola Adonaca 60 61	mathias Parnara 60
lincoles Colcombons	manustanias /hallus asm \ Theater 50
ineciea, Coleophora 66	mauretanica (banus 88p.), Thestor 58
Lithosia 9	mauretanica (jurtina ssp.), Epine-
litoralis, Leucania 24. 65	phele 8
litura Amathes 160	medon (astrarche), Plebeius, Aricia
litana ta Canada de la constantia	
liturata, Semiothisa 25	12, 15, 31, 59, 60, 65, 92, 96, 161
livornica, Phryxus, Celerio 15, 32,	medusa, Erebia
41, 156, 164	megacephala, Acronicta 88
lonicovac Zycoone 9 05 169	magaya Dayanga 9 19 65 60
Tonicerae, Zygaena 2, 65, 105	megera, rararge 2, 6, 12, 05, 05,
lorquinii, Zizera 59	90, 93, 130
lonicerae, Zygaena . 2, 85, 163 lorquinii, Zizera . 59 lota, Amathes . 24	melanoleuca (aurinia ab.), Melitaea 138
**lozerica (neoridas r.), Erebia 165, 166	melanops, Glaucopsyche 59, 81, 90,
lubricepeda (menthastri), Spilosoma	92, 102
4, 31, 65, 69, 84	melathalia (athalia Gp.), Melitaea 14
lubricepeda = lutea 4, 31, 65 lucens, Hydroecia 146, 158	meleager, Polyommatus 14
lucens Hydroecia 146 158	meliloti Zygaena 138 169
Incomic (month on in the conth on all on a)	Meliton, 2/80cm
luceria(parthenie = parthenoides r.),	meleager, Polyommatus
Melitaea	mendica, Diaphora 65, 84
lucernea, Agrotis	menorisiota (parthenologia = par-
lucida (rubricosa ab.), Pachnobia 44, 45	thenie r.), Melitaea 27, 28
	thenie 7.7, intentaca 21, 20
luciflua (athalia r .), Melitaea 112	menthastri=lubricepeda 4, 31, 65,
lucina, Hamearis 56	69, 84
lunaria, Selenia 83	meridionalis (brassicae ab.), Pieris 89
lunigera, Agrotis	meridionalis (rhamni r.), Gonep-
	mendiculans (mamin 7.), donep.
lupulina, Hepialus 85	teryx
lutarella, Lithosia 9	merularia (leucophaearia ab.),
lutea (flavago), Xanthia 24	Erannis, Hybernia 70
Integ (Inhriceneda) Spilosoma 21 CE	meticulosa Phlogophore
	teryx
lutealis, Scopula 26	mi, Euclidia 24, 85
luteolata, Opisthograptis 85	miata, Chloroclysta 44
lutealis, Scopula	miata, Chloroclysta
Lycaeides = Plebeius 31, 40	microdactyla. Adaina 88
Liveaeides = Pieneilis 51. 40	THEODORCHVIR, AUXIIII

PAGE	PA	GE.
milhauseri, Hoplites 55	niobe, Argynnis	77
Mimas	niphona, Melitaea	72
miniata, Miltochrista 31	nitida (deione r.), Melitaea 1	
minimus, Cupido 15, 57, 74, 82	Noctua, idae 9, 23, 69, 84, 95, 145, 1	63
miniosa, Taeniocampa 45 minor (cardamines ab.), Euchloë 60	noctuella, Nomophila 24, 26, 156, 1	57
minor (cardamines ab.), Euchloë 60	nomion, Parnassius 1	20
minor (furuncula ab.), Miana,		60
Oligia 139	notata, Semiothisa 16,	25
minor (pallens ab.), Leucania 139	notha, Brephos 15,	6 9
minor = nana (brassicae ab.) 89	11000001111ate	3
minor (oleracea ab.), Mamestra,	nouna (evagore r.), Teracolus	.7
Hadena		44
minuscula (furuncula ab.), Miana 139	nubigena (purpuralis ssp.), Zygaena 1	38
mitfordella, Masonia	nudella, Psychidea 97, 133, 1	30
mnemosyne, Parnassius 73	Nymphanaae oo,	13
mohammed (proto ssp.), Sloperia 60	obelisca, Agrotis	23
monacha, Lymantria 15 moneta, Plusia 167	obeliscata, Thera	01
moneta, Plusia	obfuscaria = myrtillata	64
mongolica(parthenie = parthenoides	oblongata = centaureata	85
r.), Melitaea 28, 29 montanata, Xanthorhoë 25, 85	obscura (fucosa ab.), Hydoecia 1	96
montanata, Xanthorhoë 25, 85	obscura (oleracea ab.), Hadena,	00
montanella, Bankesia I18 monuste = phileta 48		39
monuste = phileta 48		94
mucronata (plumbaria), Ortholitha,	obscurior (euphrosyne r.), Brenthis,	7.4
Eubolia 25, 146	Boloria	14
mucronellus, Schoenobius 26	obsoleta, Heliothis 155, 15	96
multistrigaria, Calostigia 44	obsoleta (oleracea ab.), Hadena,	
munda, Taeniocampa 45 mundana, Nudaria 4		39
mundana, Nudaria 4		57
muralis, Metachrostis, Bryophila 157	obstipata (fluviata), Orthonoma,	
murinata, Minoa 15 muriana, Cacoecia 10	Cidaria 25,	62
muriana, Cacoecia 10	occitanica, Zygaena 1	46
mussinae (parthenie = parthenoides	Cidaria	64
r.), Melitaea 29	ochrea (rectangulata ab.), Chloro-	~ ~
myrtillata (obfuscaria), Gnophos 64, 101	chlystis 1	58
nana (dentina), Hadena 23	ochrea (sericealis ab.), Rivula 1 ochrearia, Aspitates 15,	
nana (brassicae ab.), Pieris 89	ochrearia, Aspitates 15,	66
nana (oleracea ab.), Mamestra 139	,	15
nana (pallens ab.), Leucania 139	oculea, Apamea	23
napi, Pieris 2, 11, 60, 69, 74, 76,	oculea (nictitans), Hydroecia 24,	
90, 91, 156	146, 1	
nebulata (dilutata), Oporinia 163	oleracea, Hadena, Mamestra 1	
neoridas, Erebia 165	onopordi, Hesperia	60
**nestonclara (euphrosyne r .),	onosmella, Coleophora	83
**nestonclara (euphrosyne r.), Brenthis, Boloria 112, 113, 120 nephele (euphrosyne r.), Brenthis,		15
nephele (euphrosyne r.), Brenthis,	onima, Taeniocampa	16
Boloria	orbitulus, Plebeius	40
neston (euphrosyne r.), Brenthis,	orbona (subsequa), Triphaena 10	61
Boloria . 111, 112, 113, 121, 141	orientalis (epiphron ssp.), Erebia 10	67
neustria, Malacosoma 116	1 //	67
nevadensis (deione r.), Melitaea 141	**orientisvivax (euphrosyne r .),	
nickerlii, Palluperina, Luperina 79		21
nictitans, Hydroecia 24, 146, 158	orion, Scolitantides 72,	73
nictitans, Hydroecia 24, 146, 158 nictitans=crinanensis 24, 146	7, 1	91
nictitans (oculea f.), Hydroecia 146	ornithopus, Xylina	24
nigerrima (galathea ab.), Melanargia 30	orphanus (euphrosyne r .), Brenthis,	
nigra (orion ab.), Scolitantides 73	Boloria	21
nigricans, Agrotis	ottomana, Erebia 10	66
nigricaria (urticae ab.), Aglais	oxycedrata, Eupithecia	83
nigricata (repandata ab.), Boarmia 16	Boloria	72
nigrina (meliloti ab.), Zygaena 138 nigrofasciaria = derivata 70, 85	**padimira (euphrosyne r .), Bren-	
nigrofasciaria = derivata 70, 85	this, Boloria 1.	13
nigroviridescens = anthrax (brassi-	palaemon, Cyclopides, Pamphila,	
cae ab.), Pieris 88	Carterocephalus 31, 55, 56, 57,	74

	PAGE	1	PAGI
pales, Brenthis, Boloria 119, pallens, Leucania	141	phragmitidis, Leucania, Calamia	
pallens, Leucania	139	phryganella, Chimabache, Diurnea	17
pallescens (fucosa ssp.), Hydroecia	146	Phyciodes	1,74
pallida (brassicae ab.), Pieris	88	pictaria, Aleucis	8
pallida (comma ab.), Adopaea		Phyciodes	174
Urbicola	61	pinastri, Sphinx piniaria, Bupalus piniperda = flammea pisi, Hadena	164
pallida (lineola ab.), Adopaea	61	piniaria, Bupalus	20
pallida (sylvanus ab.), Adopaea	61	piniperda = flammea	89
pallida (thetis ab.), Polyommatus	60	pisi, Hadena	2:
pallida (urticae ab.), Aglais	61	pityocampa, Thaumatopoea	8
pallifrons, Lithosia 8, 9, palpina, Pterostoma	31	plagiata, Anaitis	18
palpina, Pterostoma	15	Plebeius 31,	40
paludis (fucosa ssp.), Hydroecia 146,	158	plantaginis, Parasemia 4,	3.
palustris (pales r.), Brenthis, Boloria 141,		pityocampa, Thaumatopoea plagiata, Anaitis Plebeius Plantaginis, Parasemia plotina, Melitaea plumbaria = mucronata poddirins Panilio 56 72 73 76	7.
Boloria 141,	142	plumbaria = mucronata 25,	140
pamphilus, Coenonympha 2, 8, 69,		podamius, Lapino 90, 12, 19, 10,	o.
93, 98,	161	poenina (parthenoides r.), Melitaea	2
pandora, Dryas 58,	92	polaris, Brenthis, Boloria	119
paphia, Dryas 2, 58,	69	polaris, Brenthis, Boloria politella, Taleporia polychloros, Eugonia 12, 58, 75,	118
Papilio 13, 40,	174	polychloros, Eugonia 12, 58, 75,	
pandora, Dryas		76,	92
Geometra 16,	25	polycommata, Nophopteryx polygrammata, Hydriomena	4
		polygrammata, Hydriomena	8
parasita, Ocnogyna	62	polysperchon (argiades ab.), Everes	73
pariana, Simaethis	63	populata, Lygris	10.
Parnassius	145	populeti, Taeniocampa	4
parasita, Ocnogyna pariana, Simaethis	69	populata, Lygris	16
partnenie, Melitaea 57, 75, 74,	140	porcellus, Pergesa, Theretra 3,	
partnenie nec $Bork$. $=$ partnenoldes.	1	**postcarsicola (parthenoides r .),	
Kef 27, 28, 29, 30, parthenie, Bork. = aurelia, Nckrl.	140	Melitaea potatoria, Cosmotriche 69,	29
partnenie, Bork. = aurelia, Nekri.	140	potatoria, Cosmotriche 69,	8
27, 28, 29, 30, 80,		procopiani (medusa $ab.$), Erebia **praestantior (deione $r.$), Melitaea	14
parthenoides (parthenie), Melitaea 27, 28, 29,	140	prieuri, Satyrus, Nytha	19.
parvomaculata (brassicae ab.), Pieris		procellata, Melanthia, Cidaria	5
magazallara Crambara	96	Progris	10
pasiphaë, Epinephele pauperana, Eucosma pavonia, Saturnia pectinella, Psychidea pedaria, Phigalia peltigera, Heliothis pendularia, Cosymbia	8 :	procellata, Melanthia, Cidaria Procris pronoë, Erebia profundana, Argyroploce pronuba, Triphaena, Agrotis pronubana, Cacoecia pronubana, Cacoecia pronubana, Cacoecia	16
naunerana Eucosma	83	profundana Argyronloce	6
navonia Saturnia	164	nronuha. Trinhaena. Agrotis 15.	8
pectinella. Psychidea 133.	135	pronubana, Cacoecia	10
pectinitaria (viridaria). Calostigia	25	proto, Sloperia 60, 149,	150
pedaria. Phigalia	70	proto, Sloperia	174
peltigera, Heliothis 41.	130	nseudathalia = helvetica. Melitaea	
pendularia, Cosymbia	25	81,	140
nerfumaria (rhomboidaria =		psi, Acronicta	8
gemmaria f.), Boarmia 26,	46	Psychidae, Psychidea, es 83, 97, 117,	
perlellus, Crambus	26	199	134
persicariae, Mamestra	23	Pterophoridae (Alucitidae)	13
petraria = chlorosata 26,	70	pudibunda, Dasychira	
perlellus, Crambus	161	Pterophoridae (Alucitidae) pudibunda, Dasychira pudica, Cymbalophora pulchella, Utetheisa pulchellata, Eupithecia pulchrina, Plusia pulcha, Epichnopterix pulveraria, Anagoga, Numeria puncteta (defoleria ah) Hybernia	85
phaeorrhoea (chrysorrhoea), Nygmia		pulchella, Utetheisa	3.
Spilosoma	65	pulchellata, Eupithecia	2
nhaenna (eunhrogyne r.) Brenthis.		pulchrina, Plusia 24,	10
Boloria	120	pulla, Epichnopterix	8
phaiosoma (rapae f.), Pieris	172	pulveraria, Anagoga, Numeria	2
Phaloniidae	31	punctata (delonaria do.), ili bernia,	
phileta (monuste), Pieris	48	Erannis	15'
philippina (pasiphaë r.), Epine-		punctata (typhae ab.), Nonagria	15'
phele	8	punctulata, Ectropis, Tephrosia	20
philodice, Colias 172,	174	punctulata, Ectropis, Tephrosia purpuralis, Zygaena 138, purpuraria (advena ab.), Aplecta	158
Boloria	10-	purpuraria (advena ab.), Aplecta	98
00, 10, 00, 02, 120,	202	pusaria, Cabera 70, 85, pusiella, Ethmia pusillata, Eupithecia 70,	130
phoebe, Melitaea phoebus (delius), Parnassius	58	pusiella, Ethmia	18
phoebus (delius), Parnassius	120	pusillata, Eupithecia 70,	128

PA	GE		PAGE
putris, Axylia	23	russiae (japygia), Melanargia	149
pygmaeola (pallifrons ab.), Lithosia		rutilus (dispar ssp.), Chrysophanus	79
8 9	31	sacraria, Rhodometra, Sterrha	130
pyraliata, Lygris 25, 1		salicata, Calostigia, Cidaria	102
Pyralides	26	sambucaria, Ourapteryx	130
numerides Amphinese	85	conic (ruggarla) Discricio	73
		sanio (russula), Diacrisia	
pyri, Saturnia 82, 1	104	sao = sertorius 60, 74, 76,	93
pyritoides (derasa), Thyatira,		satellitia, Scopelosoma 44,	
madiosyne	82	Saturniidae	164
quadra, Oeonistis	31	Satyrus, idae 8,	14
quadripunctaria (hera), Callimorpha	16	saxatilis, Melitaea	120
	24	schulziana, Mixodia	27
quercifolia, Gastropacha 116, 1		scotica, Masonia	119
quercûs, Lasiocampa 41, 1		scrophulariae, Cucullia sebrus, Cupido 57,	144
	5 9	sebrus, Cupido 57,	81
		sebrus, Cupido 57,	OI
raphani (daplidice f.), Pontia	7	segetis (um), Agrotis, Euxoa 23, 155,	204
rapae, Pieris 11, 12, 69, 75, 76, 90,		156,	164
156, 168, 169, 170, 171, 172, 173,		seitzi, Anthocharis, Euchloë	7
174, 175, 17	76	selene, Brenthis, Boloria 15, 69,	
rapae-metra (rapae ab.), Pieris	89	114, 119, 120,	121
	46	selenis, Brenthis, Boloria 119,	
**rebeli (evias ssp.), Erebia 10		semele, Hipparchia, Satyrus 8,	90
rebeli = orientalis			72
		semiargus, Polyommatus56, 57,	12
Rebelia		semifasciana, Argyroploce, Oleuth-	100
rectangulata, Chloroclystis 18	98	reutes 63,	177
rectilinea, Hadena 10	02		177
remutaria = floslactata	25	semigracilens (aurinia ab.), Melitaea	138
rectilinea, Hadena	56	separata (brassicae ab.), Pieris	89
resinella, Evetria, Retinia 8	83	sericealis, Rivula	139
	66	sertorius (sao), Powellia 60, 74, 76,	
	66	77,	93
	82	sexalata (sexalisata), Mysticoptera,	00
rhactice (nexthenoides - nexthenic	02		15
rhaetica (parthenoides = parthenie	00	Lobophora sibilla, Limenitis 65, 66, 129,	140
r.), Melitaea	28	sibilia, Limenius 65, 66, 129,	140
rhamni, Gonepteryx 7, 12, 41, 75, 76, 83, 92, 138, 144, 14		sibyllina (neoridas r .), Erebia 165,	166
76, 83, 92, 138, 144, 14	48	signata (deione r.), Melitaea 140,	141
rhomboidaria, Boarmia 26, 4	46	simplonia, Anthocharis, Euchloë	73
Rhopalocera	1	simulata, Thera, Cidaria	101
	32	sinapis, Leptosia 15, 55, 56,	69
ripae, Agrotis	95	siphax, Cigaritis	59
ripae, Agrotis ? rivata, Epirrhoë, Xanthorhoë I rondoui (deiono r.) Molifaca 140, 14	16	gitarata Chloroelyata Cidavia	49
rondoui (deione r.), Melitaea 140, 14		cohrinate Eunitheeie	101
with Collowbare 9 79 76	00	sooia Valina	0.4
rubi, Canophrys 5, 75, 70, 8	92	socia, Ayima	09
rubi, Callophrys 3, 73, 76, 9 rubi, Macrothylacia 4, 11 rubi, Noctua 2		sociaria, Synopsia	83
rubi, Noctua 2	23	sociata = alternata	85
,,	61	sociella, Aphomia 26,	73
rubricosa, Pachnobia, Triphaena 44,	1	Solenobia	117
45, 8	82 .	solidaginis, Calocampa	16
rubrifera (advena ab.), Aplecta,		sororcula, Lithosia	58
	95	sociata, Eupithecia socia, Xylina sociata, Synopsia sociata = alternata sociata, Aphomia sociata, Aphomia sociata, Aphomia sociata, Aphomia sociata, Aphomia solidaginis, Calocampa sororcula, Lithosia spadicearia (ferrugata), Coremia, Xanthorhoë Sphinx (gidae) 3, 13, 116, 163,	
rubrociliata (margaritata ab.),		Xanthorhoë	158
Campuo Metrocampo 15	57	Sphinx (gidae) 3, 13, 116, 163,	164
Campaea, Metrocampa 15	50	spinia (gidae) 5, 15, 110, 105,	103
ruia (lucosa ao.), nyuroecia 15	50	splendida (jurtina ab.), Epinephele	1.40
rufa (fucosa ab.), Hydroecia 15 rufana, Argyroploce 17	77	128,	
rufo-albo (fucosa ab.), Hydroecia 15		splendidulana, Pammene, Coccyx	83
rufo-maculata (croceus $ab.$), Colias 15	57	spuleri, Synanthedon, Sesia 53, 54,	55
rufuncula (furuncula ab.), Miana,		staintoni, Bankesia 117,	118
Oligia 13	39	staintoniana (grevillana) Penthina	
	85	63,	77
	91	statices, Adscita, Procris, Ino 15, 26,	85
	40		
		statilinus, Nytha, Satyrus 111,	7.23
rurea, Xylophasia	24	staudingeri, Conistra	83
rusaika (euphrosyne r .), Boloria,	20	stellatarum, Macroglossum 128, 130,	
Brenthis 12	20	strataria, Biston, Amphidasis 15,	85

PAGE	PAGE
striata, (brassicae ab.), Pieris 89	**transylvaniensis (tyndarus r.), Erebia
striata, Euprepia 82	Erebia 166
strigata = aestivaria 25	transylvaniensis = retyezarica 166
striata, Euprepia 82 strigata = aestivaria 25 strigilis, Miana, Oligia 145	tremulae (dictaea), Pheosia,
strigula (porphyrea), Agrotis, Euxoa 23	Notodonta
strobilella, Laspeyresia, Grapho-	trepida = anceps 82
litha 93	trepidaria, Psodos 102
subflavopicta (cardamines ab.),	trifolii, Pachygastria, Lasiocampa 116
Euchloë 30	tuima aulata (huaggiana al) Diania On
subflavopicta (cardamines ab.), Euchloë 30 sublustris, Xylophasia 15	trimacutata (brassicae ab.), Fieris 89 tripartita, Habrostola
	triplasia, Habrostola 24
subrosea, Agrotis, Fluxoa	tristata Enirrhoë 101
succenturiata Eunithecia 25	tritici Agrotis 23
suffuse — vasilon 164	trivia Malitaga 120 139
suffuse (shi sh) Polis 161	trungete Drestrome 10 25
suffuse (excess ab) Coling 157	tubuloca Telepovia 118
suffuse (mellons ab.) Tomasia 120	tubulosa, Taleporia
sumusa (panens ao.), Leucania 159	turattii, Euxoa . 83 tyndarus, Erebia
aupra-macrata (brassicae ac.), 1 ieria Co	tyndarus, Erebia
suspecta = iners	typhae, Nonagria 157
syllius, Melanargia 8	udmanniana, Aspis
sylvanus, Augiades, Adopaea 60,	umbra (euphrosyne r .), Brenthis
61, 69, 73	Boloria
sylvata (ulmata), Abraxas 15	unangulata, Euphyia, Anticlea 25
syringaria, Phalaena, Hygrochroa 25	Urbicolae 40
tabaniformis, Sciapteron, Paran-	urticae, Aglais 2, 13, 22, 32, 41, 61,
threna 55	69, 79, 128, 130, 156
Taeniocampidae 45	urticata, Eurrhypara 26
taeniadactylus = calodactylus 63	**ussuriae (pacifica r.), Melitaea 72
threna	vaccinii, Orrhodia, Cerastis 24, 43,
tagis, Euchloë, Anthocharis 7, 81, 92	44 160
Taleporia 118	valesina (paphia ab.). Dryas 2
taras (malvae ab.), Hesperia 73	Vanessa 58
taravaci (blanda) Caradrina 94	valesina (paphia ab.), Dryas
tarcenta (pronoë r.), Erebia 165 tarsipennalis, Zanclognatha 24	**varia (propos r) Erchia 165
terrinonnalis Zanalognatha 24	variabella (varia r.) Melitaea 140
tau. Aglia	**varianana (euphrosyne r.), Bren-
toliconus Cuntamous	this Polorie 114 191
tements Ponts	this, Boloria
temerata, Dapta 29, 96	vazquezi (orassicae ao.), Fieris 05
tendensis = progotarus (pales r .),	venosata, Eupithecia 25 verbasci, Cuculia 144, 176 vernella, Bankesia 117, 118
Brentnis, Boloria 142	verbasci, Cuculia 144, 176
tenebrata, Heliaca 85	vernella, Bankesla 117, 118
tereorena, Caterenna, Aystophora 85	vernetensis (dictynna = diamina r .),
tessinorum (deione r.), Melitaea 140	Melitaea
testacea, Luperina 161 testudinaria, Hyphoraia, Arctia 82	versicolora, Dimorpha, Endromis 44
testudinaria, Hyphoraia, Arctia 82	versicolor, Miana 145
tetramelana (aurinia ab.), Melitaea 30	vernetensis (dictynna = diamina r.), Melitaea
thalassina, Mamestra, Hadena ., 161	thedon, Sesia 41 vestalis, Bijugis, Acentra 97, 135
thaumas = flava (linea)	vestalis, Bijugis, Acentra 97, 135
theophrastus, Tarucus 59	vestigialis, Agrotis, Euxoa 23, 129,
theophrastus, Tarucus 59 therapne, Powellia 59, 77	130, 164
thersites, Polyommatus 56, 57, 58,	**vesubiana (deione r .), Melitaea 141
72, 92	**vesubiella (deione r.). Melitaea 141
thetis (bellargus, adonis), Polyom-	vetusta, Calocampa
matus 15 59 60 149	yicrama (baton), Scolitantides 59
Thyatiridae	victori (urticae, ab.), Aglais 32
thymula Calama	viminalia Clancaria 24
matus 15, 59, 60, 149 Thyatiridae 3 thymula, Celama 82 tiliae, Mimas 3, 30, 65. 84, 164	vinula Caritra
tinuliformia Synanthodon Socie	viminalis, Cleoceris
tipuliformis, Synanthedon, Sesia 54	virgida na Toutris av.), Minna, Oligia 100
tithonus, Epinephele 2, 90	viridana, Torerix 26, 130
tityus, Hemaris	viridaria, Phytometra 24
Tortrices 26	viridaria = pectinitaria 25
tithonus, Epinephele 2, 90 tityus, Hemaris Tortrices tragopoginis, Amphipyra	viridana, Tortrix
transalpina, Zygaena 47	vitellina = pallifrons, Lithosia 8, 9
	vitrina (tiliae ab .), Mimas 30

PA	GE PAGE
viridior (muralis ab.), Metachrostis,	RHYNCHOTA.
Bryophila	157
	23 acanthocephala, Leptodema 155
\mathbf{x} anthostigma (didyma = secalis $ab.$),	albopunctatus, Rhinocoris 155 annulatum (oleraceum v.), Eury-
Hadena 1	dema 72
	annulines Onecombolus 155
ypsilon (suffusa), Agrotis, Euxoa 1	haavananuunai Castuanada 155
n i n	hagehiagmana Tribalacanhala 154
zelleri, Parnara	and Omenanhalus
zetterstedtii = calodactylus	carbonarius Coranus 155
	centrotus Cornutus 79
zonaria, Nyssia, Apocheima 15, zonata(halterata = hexapterata ab.),	cinnamopterus, Endochus 155
Lohophore	150
Lobophora Zygaena (idae) 19, 21, 26, 158, 1	
	dorsata, Triecphora
NEUROPTERA.	flavoannulatus, Varus 155
abttindens, Rhyacophila	73 formosus, Phonoctomus 155
fuliginosa, Sialis 72,	73 fuscus, Psammochares 73
gudificatus, Philopotamus	57 hewitti, Ploearia 156
	57 laevigatum, Stenodema 72
Nemoura perla, Chrysopa	74 linearis, Ranatra 129
perla, Chrysopa	74 lineatum, Graphosoma 154
ORTHOPTERA.	lugubris, Pirates 155
-11.16 D (1)	lurco, Acanthaspis 155
	53 marginatus, Syromastes 57
Ameles	
1 0 10 1	
decipiens, Forficula	
germanica, Oedipoda	
grisea, Metrioptera	
hispanica, Ramburiella 1	
intermedia, Metrioptera 18	
italicus, Calliptenus 1	
lesnei, Forficula	98 sagittifera, Rhaphigaster 72
lurida, Forficula	98 sanguinolenta, Cercopis 73
	81 saxatalis, Lygaeus 72
pulvinatus, Euchorthippus 18	53 segmentarius, Rhinocoris 155
raymondi, Omocestus 1	
rufipes, Omocestus 18	53 tibialis, Rhinocoris 155
	Triecphora
	tristis, Rhinocoris 155
	gg lypica, Chiunga 02
vagans, Chorthippus 18	
vulcanius, Calliptenus 18	
PARANEUROPTERA.	vittata, Coranopsis 156
cyanea, Aeshna 18	56
grandis, Aeshna 1	56 affinis, Atypus (Aran.) 67
miata, Aeshna 18 puella, Agrion 18	56 aquatica, Argyroneta (Aran.) 67
puella, Agrion 18	56 Chermidae 32
sanguineum, Sympetrum 1	56 diademata, Epeira (Aran.) 67
striolatum, Sympetrum 18	56 dubius, Stenophylax (Trich.) 160
Cor	RRECTIONS.
p. 7. After " p. 167" inser	
	"H. Donisthorpe, F.Z.S., F.E.S.

- p. 60. Correct "C." Mosley to "S. L." Mosley in title of article.
- Insert (line 6 from bottom) aestiva the name of the 2nd brood of p. 60. medon.
- p. 73. Line 9 from bottom read orion in place of arion.
- p. 156. In title insert date "1932." p. 157. Correct vividior to viridior. p. 164. Correct Aglaia to Aglia.



